BURNING ISSUES

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CHRISTIAN SOCIAL THOUGHT IN A FUTURE PERSPECTIVE

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CONTENTS

page

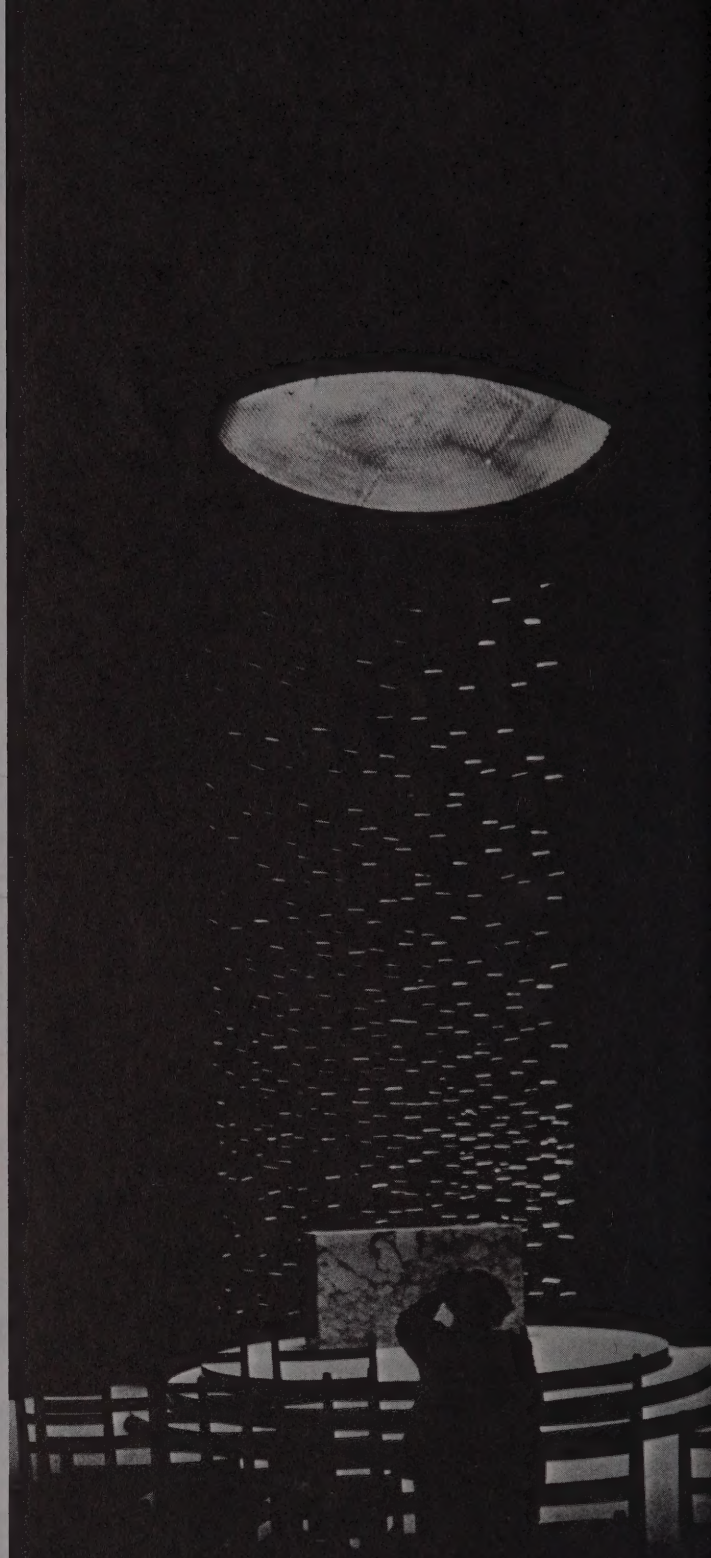
I. The Ideological and Theological Debate about Science
(Papers from the Consultation in Cambridge, June 20-26, 1977)
The Cambridge Colloquium, *Introduction by Mary Hesse* . . . 4
Report of the Cambridge Consultation 5
A Statement of the Issues, *Mary Hesse* 8
The State of the Debate about Science and Ideology in Latin America, *Rubem Alves* 11
Ethical Queries about Modern Science, *Schubert M. Ogden* . . 15

II. Ecumenial Conference at MIT 20

III. Humanity, Nature and God *(Papers from the Consultation in Zürich, July 11-16, 1977)*
Report of the Zürich Consultation 22
Biblical Views of Nature, *John Austin Baker* 40
The Old Testament View of Nature, *Klaus Koch* 47
The Organic Image of Nature, Humanity and God, *Charles Birch* 52
God and Nature, *Charles Hartshorne* 58
An Eastern Orthodox Perspective of Nature, Man and God, *Paulos Gregorios* 64

IV. Commentary of the Working Committee *(Morscharch, Switzerland, July 1977)*
"Theology, Science and Human Purpose" 69

V. Statement "Christian Hope and the Natural Sciences" from the Commission on Faith and Order *(Bangalore, India, August 1978)* 75



Design & photos
John Taylor

BURNING ISSUES?

A few years ago scarcely anyone would have thought that the topics in this issue of *Anticipation* were "burning issues". They were the safe, the innocuous theoretical topics, the discussion of which aroused serious debate only in a few esoteric circles. Today they have become widely debated issues and it is generally admitted that on the outcome of the debate hangs the future of the world and the fate of its peoples. To societies which had accepted almost without question the promises of science and technology, the questioning of those promises comes as an enormous shock and unsettles nearly every area of their life. Confidence in the future of scientifically and technologically organized society has been shaken. Does it have a future? Is there any alternative? Beyond these questions is that of the right relation between humanity and nature, the answer to which might help us to determine the limits of science and technology – if any. And what is the consequence of our Christian understanding of faith in God for our answer to all such questions?

This issue of *Anticipation* takes up these very "burning issues". The papers and reports published here come from consultations convened in 1977, and are presented as preparatory material for the discussion of these topics that will take place at the WCC World Conference on Faith, Science and the Future, in MIT near Boston, USA, July 12-24, 1979.

The authors include:

1. *From the Ecumenical Colloquium on the Ideological and Theological Debate about Science, Cambridge, June 20-26, 1977*
   Prof. Mary Hesse, Professor of the Philosophy of Science, Cambridge University (who also Chaired the Colloquium)
   Prof. Rubem Alves, Professor of Philosophy at the Universidade Estadual de Campinas, Sao Paulo, Brazil
   Prof. Schubert Ogden, Professor of Philosophical Theology at Perkins School of Theology, Dallas, Texas
2. *From the Consultation on Nature, Humanity and God, Zürich, July 11-16, 1977*
   Canon John Austin Baker, Westminster Abbey, London
   Prof. Klaus Koch, Professor of Old Testament, University of Hamburg
   Prof. Charles Birch, Challis Professor of Biology, University of Sydney, Australia
   Prof. Charles Hartshorne, Professor of Philosophy, University of Texas
   Metropolitan Paulos Gregorios, New Delhi, India

In addition we present the comments of the Working Committee on Church and Society which received these papers and reports and offered its own thoughts and reflections on them.

Finally we publish a contribution prepared by the WCC's Commission on Faith and Order on "Christian Hope and the Natural Sciences". This was prepared at the meeting of the Commission in Bangalore, India, August 1978.

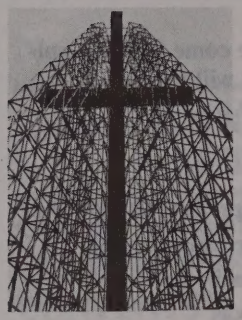
We apologize to our readers for our long silence. We regret that no issues of *Anticipation* appeared in 1978; we are pleased that so many of you asked why. The answer is that we have been immersed in the preparations for the 1979 Conference on Faith, Science and the Future, including the publication of the book of preparatory readings for the Conference. For those who will participate in the Conference and also for those will not, we include some pictures of the site of the meeting, the famous Massachusetts Institute of Technology, and a brief description of some of the issues to be discussed there.

Paul Abrecht

I

The Ideological and Theological Debate about Science

(Papers from the Consultation in Cambridge, June 20-26, 1977)



THE CAMBRIDGE COLLOQUIUM

Introduction by Mary Hesse

The World Council has for some years been concerned in its discussions with the social and ethical implications of various applications of science and technology.

These discussions threw up some fundamental theoretical questions about the nature of science itself, and how it should be understood in the perspective of Christian faith. These questions arise in particular from two kinds of development of secular thinking:

1. New views of science coming from studies in the history and philosophy of science (Popper, Kuhn, etc.).
2. Critiques of the social significance of science and technology coming from (a) neo-Marxist groups (Marcuse, etc.) and (b) writers on environmental issues and on the counter-culture (Roszak, etc.).

The Cambridge Colloquium was therefore designed to bring to bear some secular discussion or Christian debate. Its membership, for this reason had rather less experience of WCC-type meetings than is usual. Out of the 22 or so members there were four Roman Catholics, one young representative of the English new left, two sociologists of religion, one agnostic Nobel Prize winner molecular biologist (Maurice Wilkins) and, for some sessions, a British Labour M.P. There were five or six regular WCC participants, mostly with theological background. It turned out, however, and was remarked on several times in the meeting, that we had not given sufficient opportunity in the structure of the programme for the theological contribution.

We started with expository and critical papers (by Mary Hesse and André Dumas) on the empiricist view of science, and on empiricism as a total world-view, together with recent critiques of this from within the theological tradition and from the philosophy and history of science itself. The first section of our report reflects this discussion, and draws the conclusion that the confident dominance of science, as providing the only intellectually respectable view of the world, is a thing of the past. However, it is clear that if this battle is won, it is not universally known to be won.

There is a remaining task to think through its implications for the old science-religion debates and to reformulate these; and there is also an educational task to disseminate the results to many in the churches and elsewhere who are still puzzled about the status of religion vis-à-vis the scientific world-view. The collapse of the confident dominance of science as a universal system of belief is an extremely significant development for late 20th century man, and it has left a vacuum of belief. People's beliefs matter, and interact closely with their actions, as Marxists in particular are well aware. It is not a time for Christians to neglect the attempt to understand and express their faith in terms relevant to current secular thinking. All these concerns are mentioned as further tasks in Section I of the Report.

We had one session on "Marxism as a Scientific World-View", addressed by Prof. Rubem Alves from Brazil and Dr. Brian Easlea from England. It was notable that Alves did not consider that there was anything particularly *different* about the approach to *philosophy* of science by Latin American Marxist movements, but rather that this philosophical discussion was seen as almost totally irrelevant, the real task being the *political* and *economic* critique of the application of science and technology in the developing world. The Marxist critique, and his own, is practical not theoretical. Easlea presented what he himself called a "naïve plea" for an ideal liberated society in which science will be informed by a non-exploitative view of nature. In this he seemed to many of us typical of a view which is fairly powerful among politically radical students in the West, though not adopted by anything like a majority of young students, professors or scientists there. In this session on Marxism we did not unfortunately have any representative of the debate about science in the socialist countries. A Colloquium member from Yugoslavia, Ivan Supek, had sent a paper, but was unfortunately at the last minute not able to come.

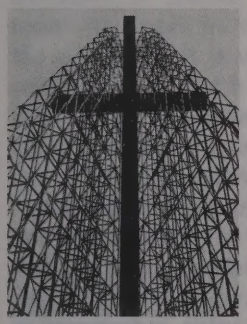
Our remaining sessions concerned approaches to ethical problems of science by a biological scientist (Maurice Wilkins) and a theologian (Schubert Ogden), the challenge of social science to religious faith by a sociologist of religion, and presentations of the problems of science as seen by a representative of Islam (Prof. S.H. Nasr from Iran) and Prof. R.A. Sinari, a representative from India. Various issues arise here which may be the concern of the WCC, but which we do not pursue in the Report.

Two working groups concentrated on (1) critique of science as knowledge; (2) critique of science as human activity, together with the issues of value judgement involved in science, and the human effects of science held and used as an ideology. The discussions of groups (1) are reported

in Section I, and part of the discussions of group (2) in Section 2, where we also tried to explore the sense in which we use the ambiguous term "ideology".

As a somewhat side-issue, group (2) spent some time on the implications for religious belief of the *social* sciences, which some of us felt are the new sources of theoretical difficulty, about religious belief. I want here to emphasize particularly some quite moving appeals from two of our members who are agnostics, to theologians and Christians generally, to take much more trouble in *explaining* what credentials and justifications they think they have for saying something about the philosophy, politics and ethics of science. What are the distinctive things Christians have to say that the secular world is not already saying? A certain impatience and incomprehension of this was exhibited by both lay Christians and professoral theologians present.

There is a mutual breakdown of communication here between the thinking of the Church and the secular world, and it came out in very concrete and personal terms at our meetings. We found ourselves, for instance, discussing deep and perennial problems of theology and metaphysics as a direct result of pressure from an openly agnostic sociologist of religion. These problems were shown to be not only archaic but contemporary and relevant to our present concerns, and point to the need for further study by the WCC. We have tried to focus these conerns in Section 3 of our Report.



REPORT OF THE CAMBRIDGE CONSULTATION

1. Science as Knowledge

Science is primarily a form of knowledge. As knowledge, it is by that very fact power, and its possession confers authority. Its initiatives are set apart; their language and their techniques are the privilege of relatively few, even though in principle, they may (as Bacon hoped) be available to 'the meanest of wits'. Scientific knowledge has made possible a technology which has quite literally transformed the world, at a pace that has greatly increased in the decades since World War II.

In all these respects, science has from the beginning been perceived as a challenge to religious faith. Science has been thought to set down the norms for what should count as 'knowing', and in the light of those norms, the 'knowledge' that people of faith claim to have of God and his relations with man and nature has appeared shadowy or even illusory. The pursuit of science has often been regarded as altogether autonomous, in no way answerable to outside norms or needs. And the technological change it made possible raised all sorts of troublesome questions for people of religious faith for which nothing in their own tradition had quite prepared them.

Fifty years ago, the status of science and technology in the Western world was undisputed. Science gave the promise of a total and definitive explanation of the world, and technology had already begun to make over that world to the image of human hopes. The authority of science, and consequently of the scientist, was in the eyes of many supreme. It is surely one of the most striking features of our own time that science and technology have come under sharp attack, both in the Western and in the Third Worlds. There has been a shift in science's own self-image, and the authority of the scientist with the general public no longer goes unchallenged.

Our concern here is to chart these changes and to reflect theologically on their meaning. There are, it would seem, three tasks in particular that ought to be pursued. The first is an evaluation of the significance to the believer and to the theologian of the changes that have been proposed by philosophers of science in recent years in regard to the very nature of science itself. The second task is to discuss the nature of science as a human activity, in the light of Christian faith, and the third is the evaluation of the ethics of research and technology from a theological standpoint. It is to the first issue that this section will be devoted.

2. The Critique of the Idea of Objective and Value Free Science

The simple empiricist ideal of science which to a large extent informed the debate between science and religion from the time of Bacon onwards has been strongly criticized in recent decades, and is now fairly generally rejected by philosophers and historians of science. The older view offered an attractively simple account of science as resting on a firm foundation of fact, from which by means of a well-defined logic or method, the scientist went on to construct the laws of nature. These laws could come to be known with certainty, and thus scientific knowledge would steadily accumulate. There was, it would appear, a sharp division between scientific and other forms of knowledge, so sharp indeed that the title 'knowledge' could be applied only in a loose sense, perhaps, outside the domain of empirically verifiable fact and law.

Such a view of science made both religious belief and theology seem vulnerable. The ideal of knowledge it offered was methodic and effective. It rested squarely on experience, and provided an agreed means of testing all claims made. There was nothing of the personal or subjective about it; it was quite apparently objective and value-free.

It is now apparent that this simple account of science does not work. First, the facts of science have to be expressed in a language, and this language itself is not neutral; it is part of what is being evaluated. The language of science is in steady, if slow, transformation and the basic changes in science are the changes in fundamental concepts or in imaginative models. Scientific knowledge does not simply accumulate, in the sense of one result being added, untransformed, to another. There *is* an accumulation of observations and laws, it is true, but there is also constant transformation as the results of an earlier generation are reformulated in the language of a later one.

There is no logic or method which leads scientists infallibly to their claims. Theories, not laws, seem to most scientists to be the heart of science, and the assessment of theory is a complex and sometimes controversial affair. It involves such values as simplicity, fertility, coherence, whose articulation and relative weight have differed from one period to another and still may vary from one scientist to another. It involves regulative principles of a broadly metaphysical sort in regard to such features of the world as causal connection. The theories themselves are never more than provisional; there is always the possibility of a further conceptual development or of another imaginative extension of the underlying explanatory model. Science cannot attain truth, then, if by truth is meant some definitive and final account, in a language forever immune to further development. Its overriding criterion for good theories is that of successful learning and prediction of the structure of the environment and, with the help of this criterion, theories are continually assessed, accepted or rejected, as experimental observations progressively accumulate. What it offers is highly warranted knowledge, the best explanatory account available to us.

The models of the scientist have something in common with the metaphors of the poet in that they serve the imagination as a resource for the comprehension of complex reality which literal language could not capture. The suggestive language of electron 'spin' allowed the imaginative development of a powerful and successful theory; one can see analogies between such a development and that of a shaping metaphor in a great poem. Of course, there are important differences, particularly at the level of assessment, but one of the most important advances of recent years in theory of science has been the clearer realization of the inescapable metaphoric character of the work of the scientist.

When one comes to the social sciences, the older empiricist ideal of science is even less adequate, and its call for 'value-free' knowledge is even less plausible. Human interest enters into the shaping of social sciences in ways that are constitutive and ineliminable. This topic is taken up in the second part of the report.

To what extent is this transformation in the theory of science known to scientists themselves? Much less than one would expect. In theoretical physics, the impact of the two great 20th century theories, relativity and quantum theory, has sensitized physicists to the tentative and transformative character of scientific change. But in other parts of science the empiricist ideal is still a workable approximation, especially in the classroom. And so it is still taught and still shapes the popular image of science among non-scientists.

There is a task here, one whose magnitude should not be underestimated. But our task is a different one. It is to rethink the science-religion debate in the light of this new situation. Does it make the articulation of knowing in the domain of religious belief or of theology any easier? Does it make it more difficult? This discussion has only just begun. It ought to be noted that epistemological shifts have been occurring in Christian theology due to quite different influences, so that the task of re-evaluation here will have to take into account not only the alterations noted above in theory of science but also some far ranging and controverted initiatives from the side of theology.

A further set of questions is raised by science as a mode of *explanation*, as well as by specific scientific theories. It is worth enquiring whether our altered understanding of science affects the formulation or resolution of these issues. Is science in principle a total explanation of the natural order? Does it leave room for explanations of another sort? Ought science's claim be treated as a challenge by the Christian? Does God intervene in the natural order in any way? How is His relationship with this order to be understood? Can the Christian be a 'materialist'? Can he be a dualist, sharply separating mind and body? Does belief in God commit the believer to any sort of idealism that would be incompatible with materialism? How is the Christian belief in eternal life to be articulated in the light of contemporary views of human material reality? Are there areas of conflict between believer and scientist in regard to human freedom or human origins? If so, how are they to be mediated? Is it correct to treat the evolutionary account as incompatible with Christian notions of creation, as is still passionately argued by many groups of Christians? These are not new issues but they may require reformulation. They bear on the implications of science for Christian belief, and call for a sharper articulation of that belief.

3. Science as Human Activity

As well as being a mode of knowledge, science is a human activity. There is a need to discuss this aspect in the light of Christian faith. What sort of values confirm it, and how do these values relate to Christian morality generally? How ought the scientist, as a Christian, to view his work, and in particular, to what kinds of ethical norms ought he to be sensitive? Some of these questions were taken up at the meeting, particularly the question of value judgements in science, and that of the critique of the ideology of science.

A. Fact and Value in Descriptive Science

In our attempts to describe the constraints imposed upon us by the social and natural world we have to use tools (such as language and perception) which are infused with our own values, interests and perspectives. This is a necessary condition of such knowledge; such necessity does not, however, imply justification for infusing just any value into science. In order to bring about that state of affairs that we value, and in order to diminish elements to which we attach negative value, science can help us understand the context within which we must work and it will be the more efficient if its *findings* are as free from the subjective bias of the investigator as possible. This does not mean it should not be relevant to our interests. We should be aware that in deciding what science we do and how we use science we are chosing courses of action which ought to be evaluated.

This itself is of course a value judgement, as is the belief that the practice of discovery itself should be as value neutral as possible. The production of knowledge which is more, rather than less, objective, will be helped if one is aware of the ways in which we are not value free; for example, we work within an overall cultural paradigm, and we perceive and select according to criteria given by us rather than by the phenomenon we are studying; we describe the phenomenon in a language which is full of presuppositions and assumptions and we explain it according to concepts and theories which can be more or less relative to our individual psychology or cultural heritage. The way in which we characterize anything will have a value according to what we consider relevant, the world suggesting rather than dictating our perception of it.

If we believe that scientific knowledge can be cumulatively effective because it approximates to truths in which we are interested then we must try to counteract the subjective bias that our tools for knowledge project onto the knowledge itself. This can be done to some degree through awareness and criticism of the ways values enter the practice and rational discourse of science. For example, the organization of science itself can be criticized for its elitism, mystification, and service of ruling interests providing means of controlling people and resources.

In social science, moreover, value judgements enter in a more intimate way. We cannot begin to describe social actions without our own subjective self-knowledge of what makes particular actions meaningful for human beings and hence for a fellow human being. This does not mean that our own meaning is all we end up with, nor need we necessarily evaluate others' social norms as good or bad. But we do have to be aware that by the very act of characterization of social phenomena we are choosing to describe what we consider relevant out of the almost infinite number of potential descriptions the social world could offer us.

B. Critique of the Ideology of Science

Marxist writers have had much to say about the moral character of science as human activity. Their use of the term 'ideology' in this context has been ambiguous. On the one hand, it is used as a negative term to denote false consciousness, that is, bias due to socio-economic conditioning, and hence as something to be overcome. On the other hand it has been used positively to denote a permanent component of human activity. Ideologies in this sense are the global world-views, most of the time unconscious, which *express* the general features of the world as seen by a given society, and *influence* the behaviours of social groups by constituting programmes to either maintain or change the world. It is in this second sense that the term will be used here. In this sense even theological world-views may also be called 'ideological', without implying a negative evaluation of theology.

Modern Western science itself developed in association with a number of ideological presuppositions. Part of the ideology of science was the belief in the inherent unity of truth and goodness, knowledge and happiness: it is good to know, and knowledge contributes to the happiness of mankind. This ideological presupposition made it possible for scientists to work without asking questions as to the social implications of their work, since it was assumed that, whatever these results might be, they had to be good. Thus, protected by the presupposition that science is value-free and that knowledge is always good, it was possible for scientists to proceed without taking into consideration the socio-political and economic context in which they operated.

Today, however, the ideology of the unity between truth and goodness, knowledge and happiness, is severely questioned. The relationship between science and war, science and the control of behaviour, technology and the ecological crisis, among others, are facts which every scientist should take into consideration. Responsible scientific work thus demands a rigorous analysis of the socio-political and economic framework of the scientific enterprise. Although science is incompetent to determine values or ends, it can provide an objective clarification as to the means to be used or as to the ends which are actually achieved. Thus, given a certain goal, scientific analysis can say what means could and should be used to its attainment. Given a certain type of action, which the actor sees as leading to a certain goal, scientific analysis can indicate if it actually leads to this goal and what are the undesirable by-products of the specific action.

In the midst of our present day crisis it is urgent that the social sciences devote part of their energies to the analysis of problems which relate to the human-social consequences of science such as: a) What is the economic basis of science? b) What is the political basis of science? These two questions help us to answer the next one, which is of vital importance. c) If knowledge entails power, to whom is scientific knowledge, and therefore economic and political power being given? d) What have been the real results (as against the ideology) of science in society? The contol of human beings, the creation of a new priesthood of experts and technocrats, the intimidation of the common people, who do not have expertise, the ecological problems, etc., are indirect although undesired results of science. To the extent that science is a descriptive enterprise, its epistemological programme entails the constraint of imagination by observation. However, since our problems require a metamorphosis of the present state of affairs, the methods and results of science cannot be expanded so as to become normative in the field of ethics, politics and religion.

Sociological study of the way both science and also theology filter down to the people needs also further examination. The ordinary person has but limited access to the esoteric language and thought-structure of the scientist or the theologian. Popularizers of science and theology, however faithful and gifted, cannot ensure that the people understand the dicta of science or theology accurately. A sociological study of the theology of ordinary believers will reveal an odd mixture of aphorisms which people repeat to each other, when they have to cope with failure, tragedy, guilt or death. Similarly the common belief of many people has often more affinity with 18th or 19th century science than with current scientific understanding. The WCC should therefore make a sociologically oriented study of the filtering-down process of both science and theology with special attention to a) analysis of the process of filtering down and appropriation and its consequences for society and religion; b) clericalization and elitism in science and religion; c) the expectations of people from science-technology and theology-ethics.

4. The Relevance of Social Science for Religious Belief

A third task to which attention must be directed is the evaluation of the ethics of scientific research and technology from a theological standpoint. Challenges such as those of potentially harmful technological developments, e.g. breeder reactors and genetic manipulation, have to be posed. And there is the much broader question of appropriate technology, a question that is being asked especially from the Third World.

At our meeting we were not, however, able to deal with these questions in any detail, partly because the theological point of view was not sufficiently represented. What did become apparent, however, was that several of the natural and social scientists present considered that more general questions need to be addressed by scientists to theologians before the theological contribution to the ethics of science can be brought to bear. In other words, it was felt by some of those in touch with the predominantly humanist and agnostic outlook of the secular world, that theology needs to present its credentials in a manner that meets challenges coming from social as well as natural science.

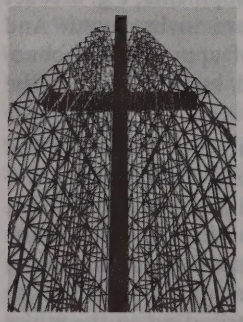
Sociology comments on religious phenomena in several ways. It tries to make inner sense of patterns of belief, behaviour and institution. It attempts to show the relationship between the social frame and its religious clothing. It discusses how the general limits, inertias, and the inherent opportunity costs of social organization bend and channel religious images; and also how particular limits and opportunity costs alter the colouring and emphasis of religious traditions. It orders the changing social map of religious belief and organizational form according to a complex, connected set of rules, and even makes very modest predictions on the basis of those rules, such that, other things being equal, if x holds then y is likely. It analyses the functions and consequences of religious beliefs and practices for the wider web of social interaction. This analysis includes such functions as social control and social persistence or alternatively conflict and change.

As the sociologist develops his analysis in these ways it becomes apparent that a situation arises for religion that is in many respects analogous to that arising from natural science at the Enlightenment. Then the ordered cosmos of Newtonian science led Leplace to say he had no need of the hypothesis of God, even though it did not logically refute the existence of God. But God became intellectually marginal, and irrelevant, and has remained so for many scientists and empiricists. Similarly the social science critique now seems to many to make transcendental reference to God redundant, because the Genesis of religions and their persistence can be explained in terms of the functional and structural theories of social science. We consider that the challenge to Christian belief from social science is as important as that from natural science, both in the sense of questioning any claim to independence of the religious domain from society, and in the sense of providing a framework of intellectual debate within which religious faith can and should be articulated. Some questions to theologians emerge naturally from our discussion about the impact of social science.

Theology articulates a 'set' or frame which gathers together into unity an approach to personal and social being, a relation of temporal and eternal, a location or image or forms for harmony and perfection, a meaning that lies beyond our immediate apprehensions and which confirms the world of natural and historic process. At the same time we may accept for the sake of argument that religion functions at least in part as an expression and symbolization of social utopias, which have practical political consequences. In considering the ethical contribution of theology, the secular scientist is entitled to ask the theologian some further questions. For example:

a. Is his ultimate hope for persons, societies and history directed to the realization of a state of affairs within the space-time world, history, and human consciousness, or does it also transcend these?
b. If it cannot be confined to this world, how can the theologian describe the transcendent in meaningful language? What is the place of symbolic language in this task? How does the transcendent relate to God, and how can we speak of God?
c. Does religious language imply that something is *true*, beyond what can be said by social scientists about the functions of religion?
d. If there is a transcendent, can we make sense of its relation to the empirical world?
e. How does the theologian *justify* his characterization of his ultimate hope?

"Giving account of the hope that is in us" cannot be done by theologians working alone. The account given must relate to the world of science as well, and the full participation of both natural scientists and social scientists in this task must be the concern of the WCC. We recommend that the theological concerns thrown up in this way by the debate about natural and social science should be incorporated into the relevant discussions of the Faith and Order Commission.



A STATEMENT OF THE ISSUES

Mary Hesse

These notes arise from an unhappiness I have felt about assumptions that seem to underly discussions on the science-faith issue in the present WCC and other Christian contexts. Many Christians, and this includes both scientists and theologians, do not seem to be aware that these assumptions are under attack, both theoretically and practically, not only in the Marxist tradition, but also in general debate in philosophy, sociology and politics. In Western Europe in particular, an alternative view of the relation of science and ideology is becoming almost commonplace among those young intellectuels and students who have increasing influence upon public attitudes towards education, science policy, religion and human values in general. This alternative view is of great importance in considering the status of religious faith, and clearly ought to be high on the agenda of work for Christian theologians. Unfortunately there is little sign yet of general awareness of it in English-speaking theology, though many German and French theologians, and some Catholics everywhere, are in the thick of the debate. Pannenberg's recently translated *Theology and the Philosophy of Science* is a notable example from the German context.

The debate can best be characterized by referring to a threefold distinction among the sciences (in the German sense of *Wissenschaften*, i.e. of "knowledge") made by Jürgen Habermas.

1. The Empirical Sciences

These have developed in their present form largely since the 17th century, but they inherited a legacy from the Greek concept of *theoria*, which Habermas describes as a *contemplative* attitude to the universe in which the aim was both theoretical and practical. It was theoretical in aiming at objective descriptive knowledge: what the world is really made of; and it was practical in being intended to induce a certain mental catharsis: the detachment of the individual from self-centred passions and illusions. Modern science retains this theoretical aim, and it has led to a view of science as the search for objective truth, free of purposes and values, and independent of the individual investigator who is supposed to be detached and passionless in his pursuit of truth. Much of the practical side of the Greek ideal has, however, been lost, because the vision of the good man seeking truth

for the sake of his own perfection in the contemplative life has been replaced by a search for truth for its own sake, and also by a Promethean vision of control and exploitation of nature, unconstrained by more humane values.

In the view typified by Habermas and other "critical" philosophers (not all Marxists), it is impossible to separate the contemplative aim of theoretical knowledge in this account from the inhumane practice it has now largely become. This view is powerfully reinforced by much 20th century criticism of the foundations of natural science in English-speaking philosophy (Popper, Kuhn, Polanyi, Feyerabend, Toulmin, etc.), where the concept of scientific theory as objective fact has come under attack. Another reinforcement is found in modern physics, and specially in the interpretations given by Bohr and Heisenberg. A third source of criticism is the German hermeneutic tradition to be described below. Habermas and others have concluded that, whatever may be said about scientific *theory*, the *distinctive* feature of modern natural science must be seen in the possibility it gives of successful prediction of the outcome of operations upon nature, that is, that aspect of science which permits technical control of nature, though of course we are not compelled to use it in an exploitative manner. The distinctive objectivity of natural science in this view is therefore its instrumentality, not any claim to tell us the fundamental nature of the world.

The presupposition still found in much Christian debate is that natural science is contemplative *theoria*. This leads to two sorts of problems:

(a) The classic science-religion debates about how what science tells us the world is contradicts what religion tells us it is: evolution v. Genesis, determinism v. freedom, law v. miracle, atheism v. theism, etc. In their old form, *these are all empty debates.* Science does *not* tell us the way the world is in any sense fundamental enough to come into conflict with the necessary presuppositions of religion. This does not mean there is no problem in these areas; it means that the form of the problem has changed. For the old form presupposed that religion too had as one of its aims contemplative knowledge of the natural world: when it began, where and how God acts, even where God lives, etc. With the old certainties about contemplative knowledge now lost, there is a whole new ball game for religious knowledge, and *we don't yet know how to formulate the rules of this game.*

(b) We should look for clues, as did the Greek Fathers, Aquinas, and all great theologians, not only in Christian tradition, but in the secular philosophies of our day. This is the approach admirably illustrated by Pannenberg, who adopts essentially the same classification of knowledge as does Habermas, and finds more clues for theology in the human than in the natural sciences.

2. The Historical Sciences

Last century German biblical scholars and philosophers articulated what may be called the *hermeneutic* method, that is, the method of rational interpretation required to translate and generally make sense of texts, institutions and belief systems of societies distinct from our own in space, time, or culture. The issues raised by this kind of problem are now recognized in a wide variety of disciplines, including biblical exegesis, social anthropology, sociology of minority and deviant groups as in criminology and the sociology of medicine, in the history of ideas and of science, and in Wittgensteinian philosophy where autonomous "forms of life" are held to be conducted according to their own "language games". There is an influential German tradition dating from the late 19th century, and including such writers as Dilthey and Weber, which sees the study of the human sciences according to the hermeneutic method as quite distinct from that of the natural sciences. It is held to involve some form of participatory understanding of the forms of rationality exhibited by cultures other than our own, and therefore to be a method which is peculiar to a *human* subject matter, as opposed to the non-human world which is the subject matter of natural science. Far from requiring a detached attitude on the part of the investigator, it demands some form of sympathetic "dialogue" with the persons under investigation, whether they are the authors of texts, or the individuals described therein, or the individuals actually met in a social situation. The method does not pretend to be value free, but explicitly adopts criteria of significance and standpoints reflecting the world-views of the participants in the dialogue, including their views of the nature of the world, societies and persons, and the peculiar interests of their own societies. In recent discussions of hermeneutics, primarily by Gadamer, the ideal is a "fusion of horizons" of investigator and investigated, so that meaningful understanding and communication can take place. The relevance for problems of biblical interpretation are obvious, and the hermeneutic method has been widely discussed and adopted by Old and New Testament scholars.

Recognition of a different methodology as appropriate for the natural and the human sciences may lead, and has in fact led, to an unfortunate dualism of approach to the natural and the human worlds. It tends to devalue those studies in social science which do seem amenable to natural science methods, and which are successful in discovering some laws of human and social behaviour. More objectionable from the point of view of many Christians is the tendency to devalue natural science as a whole, and with it the natural world as such, and to see human values and the concerns of religion as primarily God-person and person-person relations, rather than God-nature and nature-person relations. Hence the much lamented absence of a strong doctrine of creation in current theology, and in general the breakdown of the sense of the value of and responsibility for nature which was the origin of the ecology movement.

But these unfortunate consequences of hermenneutic method in some of its manifestations should not lead to rejection of its insights into the shortcomings of the accepted view of natural science. Rather it should be recognized that there are elements also of natural science that need something like the hermeneutic method. Natural science is also sometimes concerned with historical processes, needing interpretation of evidence; it also sometimes implies judgement of significance and value, for example in distinguishing normal and abnormal animal behaviour, healthy and diseased organisms, biological survival values, and in general stable and unstable physical systems. As Pannenberg argues, there is no sharp line to be drawn between human and non-human subject matters; all sciences employ both empirical and hermeneutic methods to a varying extent. More important, it is clear that the goal of the hermeneutic sciences is not simply successful prediction and the possibility of control, but is understanding and communication. This also can be extrapolated to the natural sciences, and might indeed do something to restore the proper significance of scientific *theory* as complementary to the instrumental goals of natural science. But now the "understanding" appropriate to the study of nature will not be the contemplative ideal of the Greeks, but the vision of nature *within* a human and social context, which will be expected to change as theories change, and to depend to some extent on our view of ourselves in relation to nature, society and God. There are real choices to be made about the goals of all sciences – are they to be predictive, with consequences for human happiness or exploitation, or are they to be pri-

marily for understanding and communication. The answer depends on both subject matter and surrounding social circumstances, and has to be decided case by case.

3. Critical Science

The Marxist tradition in regard to natural and social science shows two opposing tendencies which are not unlike the "liberal" distinction between empiricist and hermeneutic methodology. Marx's own writings are ambiguous, but as interpreted by Engels, and continued in the "hard" Marxism of the Soviet Union and associated Communist Parties, and in the Althuserian school of French philosophers, Marxism emphasizes the empiricist tradition and hopes for its extension into the social sciences. This is the Marxism that claims that it itself is a "scientific" theory of the world, and that the laws of conflict and development it finds in history have a status similar to that of the causal laws of natural science. This view has provided a justification for the subordination of certain scientific debates in the Soviet Union to Marxist theory in the form of "dialectical materialism", notably the debate in genetics surrounding Lysenko.

Since the publication of the works of the "young Marx", however, and associated with the "human" Marxism of Lukacs and the subsequent New Left outside the Soviet Union, there is an opposing tendency to regard the empiricist tradition in science as necessarily linked with the capitalist-industrial societies of the Western world, and therefore with support of the status quo and of inhumane exploitation of the peoples of both the Western and the Third Worlds. Detached value-free science becomes subject in this view to the same criticisms as those already brought against the empirical philosophies of science by such Western writers as Feyerabend.

One of the main sources of this Marxist-inspired critique has been the Frankfurt school of social philosophers to which Marcuse and Habermas belong. Marcuse has suggested that the establishment of socialist society will change even natural science, since empiricism is after all *not* neutral in the ideological struggle, but has been allied with bourgeois capitalism. Habermas, however, has rejected this view on the grounds of his own understanding of natural science as predictive and technical – the *instrumental* aspects of natural science do not change in the liberated society, what changes is people's attitudes towards science and its applications. But for Habermas the social sciences are a different matter. These share the *practical* interests of facilitating understanding and communication of the hermeneutic sciences, and also have the *critical* and *active* function of undermining and replacing the old society by a new emancipated society depending on free consensus in place of exploitation. Thus the social sciences (and also, for Habermas, philosophy) are *critical* sciences, and *practical* in the Greek sense of being "fit for action, or business", that is, their relevance is in the human world rather than merely instrumental in the natural world regarded as detached object.

Just as Pannenberg sees both natural and human sciences sharing empiricist and hermeneutic features to varying degrees, so Habermas sees empirical, historical, and social sciences all sharing these methodological features, together with the critical function which is determined by his utopian vision of the liberated society. Habermas objects to the pretensions of empirical science to be value free, and also objects to Gadamer's hermeneutics as essentially conservative, since it seems to depend on accepting the "others" of the dialogue as they are, without any external point of reference from which to criticize both their and our social presuppositions. Habermas finds this external point in the neo-Marxist vision of a future society; Pannenberg on the contrary finds it in the "all-determining reality" of past, present and future, which he identifies with God.

Sociology of Science

One further issue associated with critical theory is relevant here. This is the development of studies in the so-called "sociology of science". This comes in two kinds, which might be called the "weak" and "strong" forms respectively. In the weak form, the social character of scientific institutions is examined historically and contemporaneously, and the conditions of establishment and maintenance of scientific traditions discussed. In this form the content of scientific discovery as knowledge does not come into question, only the social conditions of its discovery. In the strong form, however, this approach becomes a sociology of scientific *knowledge*. Borrowing from the instrumental interpretations of science discussed above, the thesis is that the kinds of scientific hypotheses that suggest themselves at different historical periods are related to surrounding social conditions and in general to accepted ideologies. For example, it has been argued that the atomic theory of matter of the 18th century tended to be accepted by those who also held an individualistic theory of society, as against more holistic theories of both matter and society. There have been several other interesting studies of scientific disputes between different kinds of theories, where adherents lined up along social and political divides. An extreme version of this theory is seen in Marcuse, but in more moderate forms it does seem plausible to suggest that the style of scientific theory adopted in a given society is part of that society's general view of the world, and this is true in relation to modern science just as much as to ancient or mythopoeic cosmologies.

Theology

If the empirical, the hermeneutic, and the critical are, broadly speaking, the three necessary elements in how we come to know anything, they all have obvious relevance to the problem of theology, i.e. how we know God. There is only a possibility of indicating here some of the issues that arise, which take the problem beyond the usual terms of the so-called conflict of science and religion.

1. Criteria of truth for theology are necessarily drawn in any historical period from the sorts of criteria generally accepted for various forms of secular knowledge. This has been seen recently in the inconclusive debate about "theology and falsification", of which exchanges between Scholz and Barth in the 1930's (described by Pannenberg) were early examples. More recently theologians have attempted to assimilate religious belief systems into the framework of Wittgensteinian language games. These debates have been unsatisfactory not only because theologically not very profound, but also because the theory of scientific knowledge has been in a state of crisis and transformation. We can now see more clearly what has to be said about the status of science; therefore the time is ripe for reopening the question of its relation to theological knowledge.

2. Religion, specially Judeao-Christian religion, is a historical phenomenon. Pannenberg suggests that its criteria of truth must be those usually accepted for historical and hermeneutical hypotheses. Much work needs to be done in clarifying what these are, and in considering whether they exhaust the criteria required by theology.

3. Religion is a social phenomenon. What are the implications of sociological study of the structure and functions of religion in society? The Durkheim tradition is particularly relevant here, including recently Berger, Luckmann, and Mary Douglas' studies of symbols. In social anthropological studies religion is closely related with mythopoeic modes of

thought, and it is obvious how closely allied with these biblical modes of thought are. What are the implications for religion in modern societies, and for our understanding of biblical thought? Another relevant aspect of the social anthropological literature is the discussion of relativism and rationality – are belief systems, including religion, wholly relative to their social, economic and political context, or do they have independent canons of rationality? If these sorts of questions are now asked about *science* as a belief system (as discussed above), they arise even more urgently about religion.

4. Modern humanism (including Marxism) is characterized by several general theses which directly conflict with theistic faith. For example:

(a) Rejection of the supernatural or transcendent, where this is now usually understood as anything that cannot in principle be discovered and explained by scientific methods. This thesis is already undermined by the new understanding of the limitations of scientific knowledge, and also by the great variety of "scientific" methods now recognized. But as well as this negative reply, more positive reasons *for* postulating the transcendent are needed, and clarification of what this postulate would amount to.

(b) The thesis that science has superceded myth and metaphor, whereas religion seems to require it. This is also undermined by greater understanding of the function of metaphoric language in all human discourse, even in natural science, and by closer examination of the function of myth and symbol in society.

(c) The thesis that the meaning of life somehow resides in an ideal *future* of the human race in the universe. This still seems to be the inspiration of powerful political and social ideologies, although the difficulties in maintaining it are obvious: physics predicts some form of "death" of the universe, or at best perpetual meaningless recurrence; utopian visions have always failed to be realized in the past, and science gives no guarantee of greater success in the future, indeed it may be hastening doomsday. The religious antithesis to this thesis is that meaning is given *now*, now is the locus of God's relation to each person, not in isolation from past and future, but not limited by them.

(d) The thesis that morality and truth are logically independent, and that goodness is either "naturally" evolved in the biological emergence of human beings, or that what counts as "good" is a wholly irrational, existential choice. The religious antithesis is that goodness is conformity with God's will and purpose, and that goodness and truth are not independent concepts. Again, allies may be found in recent discussions of the value commitments required by science.

(e) The thesis that people are naturally good, and that evil is essentially deviance from a natural order that can be corrected by greater knowledge, and by the solution of purely technical problems, whether psychological or social. This thesis goes along with the belief that the greater evil is suffering, and the doubt that there really is "wickedness" apart from mental disease. The religious antithesis (in the Judaeo-Christian tradition) is that humans are naturally fallen, that wickedness (i.e. alienation from God) is the greatest evil, that in their fallen state people are good only by God's grace, and that suffering, far from being the greatest evil, may be redemptive and turn failure into triumph.

These secular theses are all historically related with the scientific world-view, though we now see more clearly that they are not entailed by it, indeed science furnishes some arguments against the theses. They are much more fundamental and important than the usual problems that come up in the science-faith context. Until we are clearer about the meaning and justification of the religious antitheses, we have no means either of meeting the humanist attack at its strongest points, or of dealing adequately with the more traditional science-faith problems.

THE STATE OF THE DEBATE ABOUT SCIENCE AND IDEOLOGY IN LATIN AMERICA

Rubem Alves

The topic which was assigned to me is "Marxism as Scientific World View – The State of the Debate about Science and Ideology in Latin America". This topic is part of the broader context of the dialogue between scientists, philosophers and theologians which has been going on for some years, under the sponsorship of the WCC. I understand that my remarks should be addressed to the questions which are being asked in this debate.

It is interesting to notice that when this debate began scientists, philosophers and theologians were concerned about the *ethical* and *political* implications of present-day scientific and technological developments in the fields of biology, nuclear energy and ecology. Their attention was focussed on concrete problems. Now, however, we have moved from *ethics* to *epistemology*. We are no longer talking about the world but rather about our discourses about the world.

In the first moment scientists, philosophers and theologians took for granted that they talked about a common object. But as the dialogue went on it became evident that they did not mean the same thing, since their different categorial structures constructed this object in different ways. A new problem emerged: if different categorial structures construct the world in many different and even opposed ways, is it possible at all for faith and science to engage in any meaningful dialogue? Do believers and scientists inhabit the same world? Can the scientific and the religious discourses refer to the same things? Are not these discourses built upon different categorial structures? If the objects of knowledge are determined by these structures, are not the scientific discourse and the religious discourse qualitatively different?

This *difference* is preserved in the opposition between science and ideology. But as the difference is defined in terms of *opposition*, the problem ceases to be one of *communication* between two linguistic games, and becomes the problem of the opposition between *truth* and *error*. There is a discourse which conveys knowledge: science; there

is another discourse which does not convey knowledge: ideology (religion). This conflict leads us into the epistemological problem, i.e. the grounds on which a certain discourse justifies its truth claims.

The problem of knowledge implies three questions:

"What are the categorial structures which make it possible to think of experience as a unity?" This is the epistemological question. It looks for the *a priori* conditions of the possibility of the objects of knowledge. (Notice that this *a priori* does not need to be taken in a strictly Kantian sense: even the *a priori* categories demand a genetic clarification).

"What are the operations of thought which make it possible to deduce propositions?" This is the logical question.

And finally, "what are the operations upon the real which allow us to test and correct our knowledge?" This is the methodological question.

The impossibility of a dialogue between science and religion (defined as ideology) is a consequence of the fact that religion does not pass the tests and criteria which science has established, on these three levels.

I feel I do not need to repeat Kant's critique of religion. Religion cannot be accepted as a form of knowledge because it takes as objects of knowledge that which is simply the categorial prerequisites of knowledge.

Obviously religion is once more in trouble. Science presupposes the unity of reality. The universality of scientific laws produces a discourse which makes no room for "gaps". Religion, on the contrary, makes room for the miraculous, the intervention of a divine will.

I must say a word in defense of religion against this accusation of logical inconsistency. The real problem is not that religion is logically inconsistent but rather that its categorial structures make room for a unity which is broader than the one postulated by science. This, obviously, does not add one single inch to its truth claims. *Religion constructs its world upon the presupposition of the unity between the subjective dimension of human life and the objective, cosmological and historical processes.* Once this unity is accepted its discourse can proceed in a rather consistent way. The unity on which science is based is mathematical. The unity on which religion is based is emotional, psychological.

Accordingly it seems that religious presuppositions cannot be empirically tested.

If this is the case, how is it possible for scientists and believers to talk in a meaningful way? Is any sort of confrontation possible between them on the level of discourse?

This is the general context in which I approach the debate about science and ideology, and the questions posed by a consideration of "Marxism as a Scientific World View – The State of the Debate about Science and Ideology in Latin America". Is there, within Marxism, as a "scientific world view", a positive place for ideology (religion)? Is religion totally discarded as false consciousness and as conservative ideology? If this is the case, how is it that a debate *between* science and ideology is possible (and not simply the scientific debate *about* ideology)? If this debate is accepted, are we not forced to conclude either that in every science there is an element of ideology or that there is an element of truth in ideology?

With these questions in mind I have looked for answers in Latin America. I have discovered that:

There is a debate about science and ideology which is characterized by four elements:

- It is marginal, and it is restricted to very limited academic circles.
- It is an extension of European debates like Popper-Kuhn, Popper and the Frankfurt School, Althusser. It is, therefore, an imported product which does not reveal how we are dealing with the problem.
- It makes no impact on politics.
- It is dying.

The debate, thus, is very close to *silence.* What impresses me is not the little which is said but rather that so little is said. This silence is a sure indication that epistemological questions are not considered as relevant. It is a silence which has a meaning and which is sociologically and philosophically significant.

- From the stand-point of the sociology of knowledge this silence forces us to inquire about the socio-political conditions which make possible the emergence of the epistemological discussion, and the socio-political conditions which reduce it to silence.
- From a philosophical stand-point, the silence about science and ideology is the same as a silence about the opposition between truth and error, as it is defined epistemologically. We have to ask if a new understanding of truth and error is in operation behind this silence.

I propose that the epistemological question should be clarified sociologically. What are the social conditions which are the prerequisite for the critical investigation of the criteria of knowledge? What are the functions of the epistemological discourse in different historical conditions?

I take, as my starting point, a remark made by Berger and Luckmann: "The validity of knowledge of everyday life is taken for granted by myself and by others until further notice, that is, *until a problem arises* that cannot be solved in terms of it. As long as my knowledge works satisfactorily, I am generally ready to suspend doubts about it."

It is true that this remark refers directly to our "knowledge of everyday life", but it seems that it is valid for scientific knowledge also, since scientific knowledge is an extension of common sense knowledge. It seems to me that historical investigation can show that the epistemological question emerges in times of crisis, because it is only in these situations that we begin to question the foundations of our knowledge.

In these situations the epistemological question has a double edge.

- First, it is *critical* of the *traditional forms* of knowledge. And to be critical of this knowledge means to equate it with illusion and error, in short, with ideology.
- Second, it wants to pave the way for true knowledge. It has, as its hidden agenda, the establishment of a new world.

This means that the epistemological question has a political implication, even if it is not consciously articulated. Bacon's critique of the idols, Galileo's use of mathematical models and Marx's critique of ideology are examples of what I have in mind. (It is interesting to note that the Church was not disturbed by the heliocentrism of Copernicus. His method was harmonious with theology. It was based on mystical convictions. It was inspired by religion. The same is true of Kepler. What is sinister in Galileo is his method of investigation. He proposed a way of knowledge which was subversive of the very presuppositions of the religious civilization. Copernicus is medieval, in spite of his heliocentrism. Galileo is modern, because of his method. Something similar can be said of Marxism. Its subversive element is not to be found primarily in its critique of capitalism and in its vision of a new society. The left-wing Hegelians and the utopian socialists had criticized it also and had visions

of a new order. The danger of Marxism lies precisely in the new method that it proposes and which totally undermines the liberal-capitalist way of knowledge. Marxism continues to be subversive even in a Marxist society...).

The epistemological discourse, however, has a way of hiding its political implications. Indeed, it tries to extricate itself from any relationships with the *context of discovery.* The socio-political conditions which made possible its emergence and its socio-political functions have nothing to say about its truth claims. Truth is discussed within the limits of the context of *justification.* The political function of ideology and religion, therefore, cannot be invoked as a foundation for their truth claims. This is why the scientific-philosophical critique of religion and ideology has avoided, as irrelevant, the question of the socio-political functions of these discourses. Truth and goodness are, thus, sharply distinguished.

The empiricist critique of religion, for instance, rejects religion and all global world visions (ideologies) because they do not stand the epistemological criteria which mark off the region of truth. One can only speak about objects which are given (actually or possibly) to experience. Metaphysics, religion, ideology and ethics cease to be forms of knowledge, and the function of philosophy is reduced to the analysis of scientific language.

The human sciences do not consider the religious and ideological discourses as nonsense, because they are expressions of psychic and social conditions. All symbols emerge out of fundamental and determining levels of reality (from the conflict between the unconscious and the agencies which oppose it, in psychoanalysis; from social praxis in Marxism and other branches of the social sciences). They have, therefore, an objective point of reference. They have a meaning. But this meaning is hidden on the level of conscious discourse. It has to be deciphered by science. The meaning is discovered by a double procedure. First, a critical one which denies to the conscious discourse its pretentions of knowledge. And second, a hermeneutical one, which relates the symbols to the realities from which they emerged. It is still possible to speak about God, and it makes sense. But this symbol has nothing to do with the *ens realissimum* of philosophy and theology.

We are thus faced with a twofold interdiction. The natural sciences forbid us to speak about God. [Wittgenstein: One should be silent about that which cannot be said. (T.L.Ph. paragraph 7)] It is not possible, therefore, to articulate the discourse of science with the discourse of religion and ideology. The human sciences also forbid us to speak about God, because their psychological and sociological reductionism transforms God into something else.

Do these two interdictions mean the same thing? From an epistemological point of view, yes. From the angle of the sociology of knowledge, no.

At its inception the language of the natural sciences implied a *political critique* of a dominant world view (ideology).

However, with the establishment of the utilitarian civilization its practical import shifted: *one cannot invoke any transcendent symbols as critical concepts of the established order.* The given determines the limits of the discourse. *It transformed facts into values,* and thereby sacralized those criteria which were operative within this same order. Once imagination is subordinated to observation (Comte) we are left without conceptual tools which make possible a global critique of a dominant state of affairs. As Mannheim put it, this kind of mentality, represented by North American pragmatism, asks: "How can I do this thing? How can I solve this particular problem? And in all these questions we hear the optimistic echo: 'I do not need to worry about the whole. It will take care of itself.'" And he adds: "Whoever criticizes details binds oneself, by this same critique, to the world as it is." (*Ideology and Utopia,* 237, 209).

The languages of the human sciences are not univocal as are the languages of the natural sciences. In psychoanalysis, for instance, the danger of religion (ideology) lies in its disrupting possibilities for the civilized order. With Marxism the situation is just the opposite: religion is functional to the capitalist order. Both agree that religion is false consciousness. What is curious, however, is that the same epistemological anathema hide two totally different political implications. Psychoanalysis is congruent with the utilitarian values of our civilization, whereas Marxism is incongruent with it.

How is it possible to solve the problem on the epistemological level?

One possible solution is to dis-objectify the scientific discourse. The scientific discourse is operational. It does not have any ontological claims. It provides useful conceptual tools for the manipulation of reality, whose ultimate nature is not known and is not an object of its interest. Science does not look for truth but for effectiveness. If this is the case, it is no longer impossible to speak both languages at the same time. (In the tradition of the Westminster Confession, in science we move on the level of secondary causes, whereas relevation speaks about primary causes.)

The other solution is to dis-objectify the discourse of religion (demythologization). The religious discourse does not refer to objective entities but rather to structures of experience (subjective). Once again it is possible to speak both discourses at the same time, but they cannot be interrelated, since they refer to different realms of reality.

You see that these problems arise in the context of a certain peculiar, specific definition of truth. *But what is the meaning of truth if the same truth has different social results and functions?* If one says that this order of factors has nothing to do with truth, one is implicitly affirming that this whole order is irrelevant, where truth is concerned. But what kind of truth is this which is thus given to us? Perhaps our problem is due to the fact that we are asking the wrong question within a categorial framework which makes it impossible to solve the puzzle.

I affirm that in the world of human affairs there is no sense in asking the question: "What is true?" Take, as a model, the situation of two chess-players. Each player looks at the same object (the chess board, the logical rules of the game, the position of the pieces). But this objective situation, in itself, is meaningless. The two players look at this objective situation from two opposite angles. They look for a strategic, political truth: the move which will lead one to victory. This model is a miniature of the human world. The human world is constituted not of objects for one's contemplation, but of vectors of political intention. When one asks the question of truth, in a contemplative frame of reference, one is looking for a sort of correspondence between consciousness and its object. This *might* be proper for the sciences of nature. But it is not proper of man's relation to the human world, where what is at stake is not *what is* but rather *what should be.* If we understand ideology as a discourse expressive of human interests, as expressive of man's actual position amidst the conflicting vectors of conflicting intentions, I ask: is it not possible to see ideology as expressive of man's political truth? I think that the conflict between science and ideology, as between truth and error, depends on the epistemological ideals of the natural sciences which are at present entangled in the utilitarian view of the world.

There is, however, a different situation in which the epistemological discourse emerges. Suppose that the concrete political situation has become so oppressive that to speak about the world is a dangerous act. Suppose that censorship is so strong that one is afraid of thinking about the real world. When one is no longer allowed to speak about the world one finds a "substitute gratification": one speaks about the *discourse* about the world. Epistemology is a discourse about a discourse. As mysticism is a way out of the world, so epistemology can be a way out of the world, also. The former is an expression of a political situation, as it appears in the religious discourse. The latter is an expression of a political situation as it appears in the language of science and philosophy.

It seems to me that the last 17 years of history in Latin America show, in a very short period of time, this swing of the pendulum. In the first moment the epistemological discussion had, on the one hand, a debunking intention: it wanted to criticize the liberal-capitalist way of knowing the world. When the scientific critique of ideology identified the liberal-capitalist world-view as ideology, it was, thereby, robbing it of its grounds of legitimation. On the other hand, however, it wanted to pave the way to a different world. Religion, as part of this global world-view, had to be considered as a form of false consciousness. It is remarkable that during this period there is almost nothing in the field of studies of religion. This silence is an indication that religion was not considered an object worthy of thought. What matters is the study of the economic structures which, from the point of view of Marxist epistemology, are the determining factor of social life. Marxism, during this period, is not simply one method which can be used for the understanding of reality. It is a complete world-view, which knows the secret of the foundations, the beginning, the present and the future of history. It took on a religious import.

With the advent of repressive régimes, however, it became dangerous to speak about reality. The epistemological discussion ceased to be a critical weapon in a political struggle and became an intellectual exercise. The focus of attention ceased to be the critical reading of reality and became the critical reading of the texts. How can one read *Capital* properly? How is it that Marx creates and uses his basic categories? And with this turn of mind epistemology became a rabbinical exercise of exegesis.

History, however, is full of surprises. According to the Marxist scheme, religion has to be politically conservative, and this function is related to the epistemological inversion which it produces. Suddenly, however, it is this very religious ideology, which was criticized as the ideology of the established order, which begins to speak against this same order. It is the Roman Catholic Church which now shows the insight and courage to speak about the world. This is a moment of theoretical perplexity.

Now, let us take for granted that science is concerned with truth, nothing but truth, the whole truth. From an epistemological angle, the fact that a certain ideology reserved its political function does not alter, in any way, the fact that its discourse is built upon error. Science, out of its own resources, its commitment to objectivity and its "value-free" posture has no criterion whatsoever which tells it that it should keep quiet, now. What is at stake is truth, isn't it? And religion is ideology and illusion, isn't it? We have to acknowledge, however, that only political imbecility or political commitment to the dominant state of affairs would raise its voice to criticize this ideological discourse, on the grounds of its epistemological weakness. Are we faced with a "suspension of truth"? Or – and this is another possibility – are we faced with a different kind of truth, a truth which takes into account not only contemplation but rather the incarnation of truth? From a purely epistemological angle I see no way out of the conclusion that, no matter how relevant this religious discourse may be, it is non-sense (neo-positivism) and false-consciousness (Marxism). But these critical discourses are reduced to silence. Why?

It is discourse devoid of epistemological justification which is speaking about the world. The options are: either we affirm the epistemological criteria and reject the ideological discourse, or accept the ideological discourse and reject the epistemological criteria. It seems that the silence means that we have opted for the second alternative.

This option implies that we affirm that it is an ideological discourse which is speaking the historical (political, ethical) truth.

And we are thus faced with a displacement of contemplative truth by the historically effective truth.

I return to my problem. As I said before, *the debate between science and ideology is conditioned by an epistemological ideal of truth as the correspondence between thought and reality*. This ideal creates its own criteria and tests, and any discourse which does not pass them is dismissed as ideology. To the extent that the confrontation between science and ideology (religion) takes place along these lines, I see no possibility of a dialogue between scientists and believers. The two discourses cannot be articulated.

Suppose, however, that we move away from this Greek conceptual frame of reference. Suppose that we accept the insights that we inherited from the Hebrew tradition. For instance, the idea that "word" (*Dabhar*) is not *logos*, but rather a creative function. This is beautifully portrayed in the first myth of creation: God utters His word, and a new reality comes into being. In this framework truth is not something which dwells between consciousness and object. Truth is the effective relationship between the discourse and the world which it creates. If truth, in the Greek world-view, has as its mode of existence the faculty of contemplation, for the Hebrew it has as its mode of existence its power of incarnation. I suggest, thus, that the issue: "How can we, scientists, speak about God?" and "How can we, believers, inhabit the world of science?" are futile. One is still trying to make room for God in a categorical structure which does not and cannot make room for him. I am proposing, rather, that the dialogue should begin by accepting that there are no possible solutions along these lines and by asking if the Hebrew *way of knowledge* does not open up roads which have remained hidden thus far. If truth has to do with the relation between discourse and the world that it creates, we have a new way of dealing with religions, ideologies and science.

You may ask: "How do I know that *this* – and no other – is the true human task? Capitalism is a very effective discourse. Nazism was a very effective discourse, also. This solution, you would add, seems to reduce the question of effectiveness, but it gives no hints as to what kind of effectiveness I should opt for." You are totally right. However, I think that you are then trying to solve this problem via epistemology, again. I cannot accept this solution. My original decision is not mediated by an epistemological reflection. It is just the other way round. Mine is Anselm's answer: *"Credo ut intelligam"*. Mine is Kierkegaard's answer: in the beginning it is the will, and reason is nothing but a tool and a toy of this creative will.

ETHICAL QUERIES ABOUT MODERN SCIENCE

Schubert M. Ogden

I

As is indicated by its title, the task of this paper is to initiate discussion of Theme 5 of the Colloquium. This I propose to do by taking up the three questions by which this theme was elaborated in the original statement of the Colloquium's agenda. But so that my theses directed toward answering these questions will not be misunderstood, I wish to say three things by way of clarifying my general approach to the theme as stated.

The first has to do with the meaning of the phrase "modern science". From my own reading in preparation for the Colloquium as well as, I must say, from our several discussions during it, I have the distinct impression that "modern science", or simply "science", is used rather unsystematically in several different senses, ranging from a very broad to a much stricter sense. For the most part, it is used broadly enough to include not only what I understand by "modern science" proper (in a sense I shall presently clarify) but also modern *technology*, by which I mean the practical applications of modern science, and/or modern *scientism*, by which I understand a certain ideology or metaphysics often associated with modern science. Thus if one looks over the literature bearing on our theme, one discovers, for instance, discussion of specific ethical questions raised by what has been called "biological engineering", or, perhaps, discussion of the more general ethical question, whether modern technology has not created an entirely new moral and, therefore, ethical situation. Or, alternatively, one finds discussion of questions about the extent to which a scientistic ideology or metaphysics – for which the scientific is the real, and the real is the scientific – enforces an essentially dehumanizing understanding of human existence and of the world of nature of which it is a part.

It seems to me entirely understandable and appropriate that such questions about either modern technology or modern scientism should be regarded as questions about modern science. For it is both arguable and has been ably argued (notably by Hans Jonas) that modern technology is already implicit in the essentially instrumental aim and structure of modern science as understanding for the sake of prediction and control; and one may also claim quite plausibly that modern science historically – from, let us say, Descartes to Monod – has as often as not been closely associated with some form or other of scientistic ideology or metaphysics. Nevertheless, for the purposes of the present discussion, I shall be taking "modern science" much more strictly, so as to prescind both from the practical applications of modern science in modern technology and from its ideological associations with modern scientism. So taken, "modern science" means very much what I understand Mary Hesse to mean by her "learning model of science", but what I will define here as the human activity of so understanding the order of events in the world, natural as well as human, as to be able to predict and control them for the sake of human good.

The second thing I wish to say by way of clarifying my general approach has to do with the other phrase in the theme as stated: "ethical queries". As I use terms, "ethical" and "moral" are not simply synonyms, as they clearly enough often are in ordinary English. Rather, "ethical" I take to be cognate with "ethics", which I understand to refer to the understanding or reflective moment in the human activity I call "morality", with which, naturally, I take "moral" to be cognate. Thus ethics, on my usage, is the abstractable moment of understanding or reflection involved in morality, or in human activity generally insofar as it is considered as moral. Accordingly, "ethical queries" I understand to comprise two quite distinct, even if closely related, kinds of questions: (1) the more formal, analytic kind of questions having to do with determining the constitutive factors of morality, or of human activity generally insofar as it is considered as moral; and (2) the more material, dogmatic kind of questions having to do with justifying particular moral acts or rules in terms of still more fundamental moral norms. Assuming, then, as I would, that modern science in the strict and proper sense in which I have here defined it – as a human activity of understanding – is itself a moral activity, I conclude that it is itself a proper subject of ethical queries, and that this is so with respect to both kinds of questions comprising such queries.

Thus if one asks the first, more formal, analytic kind of ethical questions about modern science, one may quite properly speak, as many analysts have done, of something like "the morality of science", or, alternatively, "the ethos of science", meaning thereby such things as science's constitutive commitment to the cause of true and universal understanding of the world in accordance with the distinctive criteria of truth implicit in its essential aim and structure, or its corollary commitments to thoroughgoing self-criticism and to faithfully telling the truth both to one's fellow scientists and, so far as possible, to one's fellow human beings generally. On the other hand, if one asks the second, more material, dogmatic kind of ethical questions about modern science, one is asking the very questions often asked by the working scientist himself about the activity of understanding in which he engages – namely, "What is the value of all this work I am doing? What is the meaning of my vocation or office as a scientist? What is the justification of my scientific activity?"

The third and final thing I wish to say by way of clarification is that I cannot regard either moral activity itself or ethics as its reflective moment as completely self-contained or self-sufficient. On the contrary, morality, in my view, necessarily presupposes faith, if not also the explicit conceptualization-symbolization of faith that is properly called "religion" or "ideology"; and ethics, correspondingly, necessarily presupposes the completely general and fundamental moment of reflection properly designated "metaphysics". The reasons for saying this may be sufficiently indicated for our purposes here by briefly considering the procedures

involved in pursuing the second main kind of ethical questions having to do with justifying particular moral acts or rules.

In general, an act may be morally justified by appeal to the relevant moral rule(s), just as a rule, in turn, may be morally justified by appeal to a still more fundamental moral principle that is relevant to determining its rightness. But in any case where there is a conflict between the relevant moral rules or principles, or where such rules and principles as exist either do not apply or else are themselves in need of justification, another justificatory procedures becomes necessary. Its major premise is not any particular moral rule or principle, but, rather, the ultimate moral principle implicit in human activity as such – namely, that the right act or rule is the one which maximizes the realization of all relevant interests even while minimizing their frustration. This implies, naturally, that the whole elaborate apparatus of our moral language and reasoning, from single concepts like "right" and "duty" up to fully developed ethical systems and theories, exists so as to make possible these two justificatory procedures. It further implies that, analogously to the case of science, the criteria of moral reasoning or justification, like the norms of morality itself, are wholly secular and autonomous, in the sense of being criteria already implied in the pursuit of our own interests in a social context in which other beings are similarly engaged.

The crucial question, however, is finally, "Which are the relevant interests?" or "Whose interests are relevant?" And this is one point where ethical questions as such as well as any possible answers to them perforce refer beyond morality and ethics to faith, if not also to religion or ideology as the explicit conceptualization-symbolization of faith. For it is precisely from faith, or, explicitly, from religion or ideology, that we can alone derive "the center of value" or "the cause of loyalty" that defines the scope of relevant interests. Any interest is relevant that is itself of interest to the inclusive "interest in interests" which is our center of value or our cause of loyalty – or, to use the constitutive concept-symbol of theistic religion, our "God". As H. Richard Niebuhr liked to say, a god is at once "a center of value", in the sense of that which can be trusted to endow all other valuable things with their value, and "a cause of loyalty", in the sense of that which claims all other valuable things as contributions to its own value.

The other point where ethical questions as such as well as any possible answers to them necessarily refer beyond morality and ethics to faith and, possibly, to religion or ideology as well is the limiting question that may be asked of any strictly moral justification of a particular act or rule. This is the question as to the ultimate meaning or significance of any such act or of any life lived in accordance with such a rule, given such facts as universal transience and death and our universal failure to live consistently by moral norms. What this question asks about is not why one should act in this particular way instead of that, or live in accordance with this particular rule instead of some other, but, rather, why one should act in any way at all, or live in accordance with any moral rule whatsoever. All our moral activity and reasoning necessarily presuppose faith in that they necessarily presuppose a positive answer of some kind to this limiting question. But, then, the same is true at its own level of ethics as the moment of reflection or understanding that constitutes morality as a distinctively human activity. Consequently, to pursue properly ethical queries about modern science is eventually to be led to questions about it that, arising from faith, are properly metaphysical.

II

I turn now to the three questions put forward in elaborating our present theme:

1. Does science provide a basis for values?

The critical question here, clearly, is the general philosophical question, "What is value?" or, alternatively, "What is properly meant by 'value'?" To this question I should wish to give the kind of answer that is generally understood to constitute a relational theory of value, i.e., a theory according to which, even though no being is valuable simply in itself, being and value are nonetheless inseparably connected because every being is or has a value, positive or negative, in relation to the interests of other beings. On this theory, in other words, "value" properly means either the good-forness or the bad-forness of one being for some other.

This means, then, that, while value is certainly relational and in that sense relative, the essential relativity of value is not subjective but objective. Being a relativity that consists in the relation between one being and the objective needs and potentialities of another, it is not the kind of relativity that consists in the relation of one being to some other being's subjective desires and preferences. Thus, for example, whether food or poison is good for an animal is due not to what the animal may subjectively desire or prefer but to its elemental need for food and its closely related need to avoid poison if it is to realize any of its distinctive potentialities as the kind of animal it is.

But if value, although relative, is in this sense objectively rather than subjectively relative, determining values is a process not of consulting someone's subjective desires or preferences but of establishing someone's objective needs and potentialities. More exactly, it is a process of learning by objective observation and understanding how one being is related to the interests of another – how, being the kind of being it is, it does or does not meet the needs or correspond to the potentialities of the other being. Insofar, then, as science may be said to consist in just such objective observation and understanding of beings in their relations with one another, science may be said to have an important role to play in determining values, whether or not it may also be said to provide the basis for them.

And as for that question, my judgment is that there is no good reason to say anything of the kind. While science may indeed play the important role in determining values of establishing the objective relations of being with being, of learning how one being relates to the interests of some other, I fail to see that there is anything else science could do by way of providing a basis for values. The only necessary and sufficient basis for values is quite clearly *prescientific*, consisting in the incredibly complex and many-sided relations of being with being which is existence as such.

2. If science does not provide a basis for values, where can such a basis be found?

In elaborating my negative, even if qualified, answer to the first question, I have already indicated my answer to the second. The basis for values is to be found in the complex and many-sided relations of beings with other beings which is existence itself. The reason for this is that value, either positive or negative, is always already present whenever one being with needs and potentialities is related to some other being that either meets its needs and corresponds to its potentialities or else fails to do so. But since to be at all in the fullest sense of the word – in the sense of being an actual entity or an existing individual – is to be in relation to others, which, therefore, are or have value, either positive or negative, being and value are inseparably connected; and

the condition that must be fulfilled in order for there to be values, and that we may quite properly speak of as "as basis for values", is always already fulfilled by the essentially social nature of existence as such.

Still, if it is just here, in the social nature of existence, that the real basis for values is to be found, it remains true that science as the objective understanding of existence may claim to play an important role in determining the values that all beings are or have in relation to the interests of others. Indeed, it is arguable that, given its essentially instrumental aim and structure, modern science is particularly well adapted to play this important role. And one may convincingly argue this even if one recognizes that the really crucial role in determining human values – the role, namely, of defining the scope of interests relevant to our own moral acts and rules – can never be played by science but only by faith, or by some explicit form of faith such as religion or ideology.

Even so, one may well ask whether the science that in principle is not as irrelevant to determining values as is sometimes claimed is in fact as adequate in providing objective understanding of existence as is often supposed. On the conventional view, science has little or nothing to do with determining, much less providing the basis for, values, even though it certainly provides more or less adequate understanding of the world and of the consequences of human intervention in it. As this view is usually expressed, science has no role to play in determining *ends*, whose basis is in our own subjective valuations, but it certainly does adequately inform us concerning the *means* by which our ends can alone be realized. But even as I have ventured to question the first part of this conventional view, I should also want to question its second part. For I find the evidence compelling that modern science only too often does not understand enough about the complex and many-sided relations of beings with one another to inform us adequately even about the so-called means essential to realizing our ends. Consequently, as confident as I am that science has an important role to play in determining our values, I should be rather more skeptical about the actual achievements of modern science in adequately determining the human values for which existence itself does, indeed, provide the basis.

3. What are the implications of the debate about science and values for the autonomy of science?

The first thing to be said in response to this question is that the autonomy of science is itself a value for which science in no way provides the basis, whatever role it may play in determining that such autonomy is a value, at least for human beings with the interests, the intellectual and other needs and potentialities, that are distinctively ours.

The other thing to be said, then, is that the status of the autonomy of science as a *positive* value is hardly in question if what is meant by such autonomy is the *Wertfreiheit* that is generally understood to be obligatory for the scientist, insofar as his commitment to true and universal understanding of the world entails that he not allow his own subjective valuations to obtrude upon and distort either his reading of the relevant evidence or his reasoning about it. In other words, if what it means for science to be autonomous is that it be "value-free" in the precise sense that would be better expressed, perhaps, by speaking instead of its being "*valuation*-free", then it must clearly be the case that science's being thus autonomous is a well-based positive value. Why? Well, because for consciously valuing beings such as ourselves, who both can and must live by their own subjective valuations, objective understanding of what really is or has value for themselves and others must itself be or have an extraordinary positive value. For there is no other reliable way than just such objective understanding whereby one's subjective valuations may be made to correspond with the objective values, positive and negative, whose basis is in existence itself.

Thus the clear implication of what I have to contribute to the debate about science and values is that the autonomy of science is, as it were, a positive value of the second power, insofar as objective understanding of beings in their relations with one another is necessary to determining all other human values.

Kresge Auditorium, site of the World Conference on Faith, Science and the Future.

MIT

Personalities and Places – For the 1979 World Conference on Faith Science and the Future.

In the photo above (from left to right) Metropolitan Gregorios of New Delhi, Moderator of the Conference; Dr. Keith Bridston, Direction of the New York Office of the WCC, a key figure in the local preparations; Prof. David Rose, scientist from MIT and leader of the local planning group; Dr. Ben Nwosu, scientist from Nigeria and member of the Conference Planning Committee.

Opposite page: The huge 'stable' by Alexander Calder, one of many works of contemporary art on the MIT Campus. – **Top right:** Kresge Hall, MIT site of the Conference. **Centre:** The MIT Chapel by the world renowned architect, Eero Saarinen, seen from the lobby of Kresge, which he also designed. – **Below:** An aerial view of the MIT Campus, a World Centre of Scientific and Technological Research. (MIT photo).

II

Ecumenical Conference at MIT

A new Ecumenical Conference will take place in the USA in July 1979 – dealing with issues of Faith, Science and the Future. Site for the Conference will be the world famous Massachusetts Institute of Technology – centre of scientific and technological research. More than 400 scientists, technologists, theologians and persons of many other disciplines will take part, representing all areas of the world. The Conference is being organized by the WCC's section on Church and Society – which since 1969 has been concerned with the theological and ethical critique of contemporary developments in science and technology.

What the Conference is all about

The Conference programme is structured around four central themes:

1. Interaction Between Science and Faith

There are new possibilities today for a creative dialogue between science and faith. The following are some of the issues to be considered at the 1979 Conference:

- There is a new awareness among scientists and technologists of the theological and ideological assumptions underlying their world view and the need to examine these more critically. Few scientists today hold the view that it would be possible to solve all the world's problems if only we had enough scientific and technological knowledge. What then are the limits of scientific enquiry and what precisely is the nature of scientific knowledge in comparison to other sorts of knowledge?
- The second issue follows from the first. What are the values which should guide scientific and technological research? How are these to be determined? And what is the contribution of faith in finding the answer to these questions?

The 1979 Conference at MIT will therefore begin with two major addresses: one by an eminent scientist on the nature of science and the second by an eminent theologian on the nature of faith. The purpose is to rethink the goals of each in a self-critical way and to work for a new understanding of their relationship. However this exchange of views can no longer be confined to Western scientists and Western theologians, as has tended to be the case in the past. The whole world now has an interest in and a contribution to make to this discussion. Hence the Conference will also hear from scientists and theologians speaking from the perspectives of other religions and cultures.

2. Ethical Issues Arising from Developments in Particular Scientific and Technological Fields

Following this general analysis the Conference will look at the ethical and social issues in specific scientific fields, especially those where the public demands clarification of the motivations and the ethical and social criteria guiding scientists and technologists working in these fields.

Some areas of concern already included in the programme are:

- The biological manipulation of life, animal and human, through genetic engineering and experiments on brains, embryos, etc.
- Energy – the debate about energy resources for the future and the consequences for society and the environment.
- The social consequences of the revolution in electronic communications and data processing.

Cutting across all these types of experimentation is the issue of the motivation and the justification for various kinds of scientific investigation, and for what is generally called "pure research". What is the justification of knowledge for knowledge's sake? "Pure" research often leads to socially significant consequences which were not and perhaps could not have been foreseen. But today people are asking whether it is responsible to embark on such scientific and technological research where the possible positive and negative consequences for humanity cannot be predicted.

3. The Economic, Social and Political Context in which the Know-how of Science and Technology may be more Equitably Used and Shared

Our world is apparently divided into two parts with contrasting economic situations. The industrially developed world has a pattern of production and consumption which, given the known resources, is now thought to be unsustainable. On the other hand, the developing countries have a level of production and consumption which leaves the great majority of their people below what is generally regarded as an acceptable level of living.

In both cases the role of science and technology is viewed differently. There are those in the developed countries who believe that economic growth must continue and that new developments in science and technology will make this possible. Others hold that because of dwindling world resources science and technology cannot maintain the Western pattern of affluence at existing or higher levels on a world scale.

In the developing countries there is also a division of opinion. Some people, perhaps the majority, believe that through science and technology they can make a great leap forward in economic and social welfare to a level approaching that of the technologically developed countries. This implies of course a new distribution of resources and technology on a world scale. Others maintain that this kind of advance would require such large-scale economic and technological change that the social and cultural basis of community would be destroyed (already in some countries) by the adoption of life styles based upon a powerful science and technology with its associated set of material and economic values.

The Conference will examine the arguments on both sides of this increasingly tense debate. The role of traditional ideologies and faiths in determining the response will also be considered.

4. A New Formulation of Christian Social Ethics for the New Age of Science and Technology

Christian social thought has, until recently, largely applauded the material benefits made possible by science and technology and was primarily concerned about their just distribution. Today it is clear that traditional conceptions of social justice must be revised and enlarged to deal with the problems posed by the failure to see the need for an ecologically and technologically sustainable society. This will require a fairly radical review of the assumptions of certain aspects of earlier Christian social thought and action.

At the moment Christian social thought is in some confusion about how to relate the concern for justice and participation to sustainability. Some feel that sustainability is secondary to justice. Others feel that a new life style is possible which would satisfy the demands of both justice and sustainability. Still others consider that the first formulations of such new life styles are, on any large scale, politically unrealistic or could only be realized through extreme authoritarian measures.

Note on Procedure

Each of these issues will be presented and discussed in plenary sessions of the Conference. They will then be referred to one of the ten sections into which the Conference will be divided. The task of these sections is to prepare a report on the issues which will, in the final days of the Conference, come back for discussion in plenary session. Thus the concluding days of the Conference will be given over to determining what the Conference will say to the churches on these issues. It will also suggest the type of action and study programme the churches and the WCC need to develop for the future. Given the controversial nature of the issues considered, it is likely that the closing days of the meeting will lead to some of the most vigorous discussion of the Conference. The inputs of the various sections, as amended and approved by the Conference, will constitute its report to the WCC and its member churches.

Loppy of Krege Hall.

III

Humanity, Nature and God

(Papers from the Consultation in Zürich, July 11-16, 1977)

REPORT OF THE ZÜRICH CONSULTATION

I. INTRODUCTION

The world and its inhabitants are threatened by the way in which science and technology are being used. Moreover the deleterious environmental impact of their use is increasing. This harmful impact of human activity on the planet is a compound effect of three things: the population explosion; increased consumption of resources as a consequence of industrialization, especially in the rich countries; and environmental deterioration brought about by pollution and soil erosion. The threat to the quality of life and even to the survival of people is both direct and indirect. One example of the direct effect is when people are harmed by the toxins produced by industry. Less direct and less obvious are the effects of environmental impact on those organisms on which the life of higher organisms depends. Some insecticides have both direct and indirect effects on people.

While this paper deals primarily with the human control of nature, there are two related issues which are implicit in the discussions: the concentration of this power over nature in a few hands and the fact that such concentrated power over nature becomes also power over people.

The way of life of the rich world is both extravagant and costly. In the end it could be self-defeating. It is ecologically unsustainable, socially unjust and increasingly uncontrollable. The plea for a world that is ecologically sustainable and socially more just is a call for a way of life that will sustain for all humanity an acceptable quality of life. It must at the same time include a concern for the life of non-human creatures.

We urgently need a new vision that will motivate and guide the concern for a sustainable, just and controllable world. Part of our problem is the view of nature, more implicit than explicit, in the way of life of the industrialized nations. There is a connection between the way we treat the earth and its resources and our attitude to nature, humanity and God. Some attitudes lead to exploitation. Others are more conducive to sustainability and justice.

A. False or Incomplete Responses to the Ecological Predicament

A number of false or incomplete answers are being given to our ecological predicament. Some of these are:

1. The "Science will handle it" answer

This is the view of technological optimism. It is widely held in the world today. It sees the solutions to most of our problems as technological.

The solutions are often pursued with little concern for the cost to human life and to nature. This is the sort of power over nature that corrupts. Moreover, it provides no answers to the questions: i) what are the limits to human intervention in nature? ii) how is the conflict between the instrumental value of nature and its intrinsic value to be resolved?

2. The "Return to Nature" answer

This is the call for total de-industrialization and a return to a simple rural culture. (Some of the proponents of this view claim to take their inspirations from Asian and African religions.) In its extreme form this is not a feasible alternative. Apart from the difficulties of imagining how this could be realized in the industrialized world, it amounts to a denial of development for the poor world. The implication of this answer is that science and technology have become and will remain evils. But science and technology are not intrinsically evil. They become evil in certain contexts and attach to themselves values that are alienating. There are also contexts in which science and technology are liberating. We may well ask: Who needs the liberation of science and technology, and how can that be achieved ? The further question is, what sort of technology and in what social context ?

3. The "God will provide" answer

Without effort on our part things will work out. God will provide.

4. The "I'm all right Jack" answer

I can look after myself, thank you. The rest of the world can look after itself.

5. The "Life-boat Ethics" answer

The nations are divided into rich life boats and poor life boats. The poor life boats are sinking. If the rich life boats let

the struggling survivors clammer on board they too will sink. If they share their resources none will survive. Better the people on the secure life boats survive than all go down. But the world is one life boat. There are first class passengers at one end and third class at the other. Can the rich say to the poor passengers, "Your end of the boat is sinking"? We sink or swim together.

6. The "Triage" answer

The world is a battlefield. Nations can be classified as casualties on a battlefield. Some will survive with aid. Others are beyond hope, no aid will save them. Better to concentrate on saving nations that are not in a hopeless state and leave the rest to perish.

7. The "Scapegoat" answer

Capitalism and Communism or some other "ism" is responsible for the problem.

8. The "Doomsday" answer

It is too late to do anything. We can only wait for the end.

9. The "We'll cross the bridge when we come to it" answer

This is an attitude of some people in the Third World. To raise the problems of environmental deterioration and resource depletion detracts from the urgent demands of social justice.

B. False or Incomplete Views of Nature and Humanity

What follows are some of the false or incomplete views of nature and humanity which give rise to the preceding "false or incomplete responses" to the ecological predicament.

1. The "pragmatic view"

Handle problems as you meet them. Don't worry about the meaning behind things. There are too many conflicting views about meaning ever to find agreement. Get on with the job and leave the theory to look after itself.

2. The "mechanistic view"

This is the dominant model of nature and man and is implicit or explicit in the thinking of many scientists. According to this view living organisms are mechanistic contrivances! It is the view taught to students and propagated in the popular press. Alternative models are being developed within science and philosophy but as yet these have hardly influenced many scientists or those they teach.

3. The "compartment view"

Science and religion deal with two distinct areas. The knowledge we derive from each can be kept in separate compartments, with little or no traffic between them.

C. The Integral View of Nature in the Bible

The problems to which these views responded are not new. They began with humanity's awareness of the need for a proper relationship with plants, animals, soil and the waters on which life depended. The stories in Genesis have to do, at least in part, with this problem of coming to terms with the plants and animals and the resources of the earth. This could not consist simply of a set of empirical rules to be observed. It was based on an understanding of what human dominion of nature should be and of the meaning to God of the life of other creatures, as well as of humanity. It was an attempt to discover a unitary view of nature, humanity and God.

However our problem is infinitely greater than that of our forebears because of the enormous power we have over nature. The challenge to us is both ethical and cosmological. It arises from both science and the global environment crisis. To meet the challenge we must call upon insights from science, from our Christian tradition and from other cultures. It is a call for theology to rethink its doctrine of humanity and nature. We must ask what has gone wrong with the Christian tradition that it has provided, as yet, so little understanding of our contemporary plight. At times it has even been a negative influence by contributing to the belief that nature could be exploited without limit.

The Old Testament and the New Testament provide more than one view of nature. Yet there is within this tradition a vision of an integral relation between humanity, God and nature. This conceptual unity was disrupted by interpretations which developed in the 17th century, a disruption that led to the possibility of humanity seeing itself as separated from nature. The consequence was a retreat of religion and theology from a conceptual unity of nature, humanity and God to one which had a more limited view of humanity detached from nature and God. Of course at the time this was looked upon as a liberating event.

Does the Christian faith as presented today offer any answer to the spiritual and intellectual questions about the relation between nature, humanity and God ? In view of the Christian involvement in the nature God debate in the past, for example as in the Darwinian controversy, it is surprising to discover how little attention Christian thinkers and churches give to the problem today. Except within Process Theology there has been only slight development of a theology of nature or a Christian ethic applicable to contemporary ecological problems.

It seems that Christians are either:

- mesmerized bv the power of science and technology and confident in the human power over nature which they foster; or
- baffled and demoralized by the awareness of their own long uncritical commitment to the scientific and technological world-view and hence their contribution to the present ecological crisis; or
- timid lest they appear to be returning to a form of natural theology which has been widely criticized: or
- afraid of being distracted from their concern for individual salvation (this often results in an anti-science bias.)

While the extent of the Christian contribution to the search for mastery over nature continues to be a matter of dispute, one thing seems clear. The churches in the technologically and industrially developed countries are facing an immense task of rediscovering and developing the meaning of their faith in relation to such urgent and practical questions as the right of humanity to continue the unlimited exploitation of the natural environment.

The following discusses, first, some underlying issues in the relation of nature, humanity and God; second, a biblical interpretation of this relationship and the contribution of African and Asian cultures; and third, some elements essential to a new vision of this relationship.

II. UNDERLYING CONCEPTUAL ISSUES

A. Instrumental Value and Intrinsic Value

Our attitude to the world is based almost, if not entirely, on its instrumental value to us. We value oil for fuel, plants for food and building materials, and animals for food and

clothing. The aesthetic value we find in nature and its value for our relaxation are also instrumental values. Almost all the arguments for more national parks, game reserves and wilderness areas are based on their instrumental value to us. We argue that whaling should be restrained on the grounds that this is the way to get the maximum value out of whales in the long run. And when that argument fails we resort to other instrumental arguments, often very substantial, that whales are an essential link in the food chains, and that to destroy them is to endanger other life of value to us. Or we argue that we need whales for scientific study; or because they are beautiful animals we like to have them around to look at.

This is an entirely anthroprocentric attitude to nature. While some of the instrumental arguments are obviously substantial, they reflect a distorted and inadequate attitude to the non-human creation. Implicit in them is the view that only humans have intrinsic value. We feel no responsibility to the non-human creatures themselves. The responsibility is only to people, present and future, who could benefit from them.

The biblical view of nature entails a human responsibility directly to non-human creatures themselves. This is based on the intrinsic value of creatures in and for themselves and for God. They have a value quite independent of any instrumental value we might impute to them. There is a strong foundation for this view in the Christian tradition. Man is not the only pebble on the cosmic beach so far as God is concerned. The intrinsic goodness of the creation is declared in Genesis 1. In Genesis 6 there is no separation among living creatures which puts only man in contact with his creator. Animals, like man, have a *nephesh* (imprecisely translated soul). God does not give man power over the *nephesh* of other living creatures. Every *nephesh* has its direct connection to God and its own value which does not depend on human will or pleasure. The God who sustains the human creation also sustains the non-human creation. The wonders of the natural order are used in the book of Job to make the point that man's whole attitude to the created order is wrong, because it is totally egoistic, totally anthroprocentric. If man were to stop even for a moment to consider the universe as it actually is, he would see that by far the greater part is of no relevance to him at all. If God created Behemoth and Leviathan, it assuredly was not for man's benefit (Job 40-41); it must have been for some purpose opaque to man, who can think only in terms of himself and his situation... God made them and delights in them for their own sake, not for some ulterior usefulness to us as human beings. And what of the short lived flowers that appear in the desert after rain where no man is ? (Job 38, 26-27). In some of his parables and sayings Jesus assumes God's care and concern for animals.

In the early centuries, as for example in the thought of Augustine, there was a strong emphasis on the intrinsic goodness of created beings. This position was maintained throughout the Middle Ages. However, in modern times the idea of intrinsic goodness has faded. We need to rediscover it. What gives any creature intrinsic value ? That God "created" it would indicate that it has intrinsic value. But this does not tell us what the nature of that value is; sentience or feeling gives intrinsic value.

There is nothing in this view to suggest that we should attribute equal value to all creatures. On the contrary "is not man worth more than many sparrows?" The Christian tradition has made a clear distinction between the value of humankind and the value of all other living creatures. It is humankind's great capacity for experience and awareness of the total environment including God that gives it its special value. The basis of the belief that human beings have value for themselves and for God provides also the basis for our attitude to all creatures. They are all our neighbours, though their value differs. There is then a hierarchy of values in the creation.

The hierarchy of values is based on capacity for feeling. The intrinsic value of a whale or a chimpanzee is presumably greater than that of a mosquito. Of course only the whale or the mosquito directly experience their own feelings. But we can imagine something about the lives of other creatures than ourselves, just as we can imagine the feelings of our fellow humans. It is more serious to destroy the life of some creatures than it is to destroy the life of others. Everything else being equal those of greater instrumental value are to be saved when a choice must be made. Of course everything else is rarely equal. There are conflicts between different sorts of instrumental value. A woodland has instrumental value for recreation, and because of its aesthetic appeal. This may conflict with the instrumental value of the timber in the trees or the minerals under the forest which others may want to mine. There are conflicts between different instrumental values. When a game reserve is turned into a grazing area for cattle, we may have to sacrifice elephants for people and the cattle they raise. The future of game reserves in heavily populated countries raises quite starkly the conflict between intrinsic values on the one hand and different instrumental values on the other. Working out an ecological ethic is a gigantic undertaking. That is no reason for not being clear about a proper understanding of the basis for any such efforts. Yet Christians have given very little attention to these concerns and the right of non-human nature.

The doctrine of the intrinsic value of non-human creatures raises the question of the intrinsic value of the inanimate creation. Do only living creatures have intrinsic value ? Or are all entities of the creation of value in and for themselves and to God ? Our answer will depend on whether we can in any sense impute any "feeling" or "experience", even in the most elemental sense, to nonliving entities. Here opinions differ.

There are those who consider that capacity for feeling "emerged" as creatures became more complexly organized. There was a discontinuity in the evolutionary process when the first organisms appeared that could feel. The alternative is to attribute feeling (and intrinsic value), however infinitesimally small in some cases, to every level of actuality, living and non-living.

If all created things, not only living ones, are so constituted as to be able to enjoy experience, however humble, then we should, to the appropriate degree, treat them as ends and not merely as means to our ends. Here the argument becomes to a degree technical. Suffice is to say that a clear distinction has to be made between organic entities and aggregates of organic entities that have no organic unity as aggregates. An electron is an organic entity. A rock is an aggregate. A cell is an organic entity with a life of its own. An animal consisting of many cells is also an organic entity in itself. Plants are more like a democracy of cells. This is an interesting area in which there is need for conversation between biologists, philosophers and theologians.

Finally, it is necessary to make clear and emphatic, as a minimal proposition, that it is not the Christian tradition that the values of nature are merely instrumental. Intrinsic values may be difficult to measure, but as a minimum we must assert that they exist. That it is easier to measure instrumental values is not an adequate reason for putting more emphasis on them than on intrinsic values. The non-human creation is not merely the stage on which the drama of human life is performed. It is itself part of the drama of creation and redemption.

B. God's Creativity is Love – the Viewpoint of Process Theology

A poet has told us to love "all things both great and small/for the dear God who loveth us/he made and loveth all". A New Testament writer says simply, "God is love". What then is the relation between divine love and the power to make or create ? A person with strong muscles has power; if the person is also loving, the love is one thing, the power another; but if God *is* love, love must itself be powerful. If we are to have even the least understanding of this, we must find indications in our experience that love, just in itself, is powerful, creative.

In Genesis we read, "God said, Let there be light, and there was light". What connects the saying and the lighting? To reply, "God's power", is merely to repeat the question. For we are asking, what makes divine love powerful? Also, what does it mean to God to say, "Let there be light"? God's mere loving thought or will must cause the light. Have we any experience showing that mere thought, will, or love can produce results?

Love is known to be in truth powerful or creative. Infants are born not in the full sense persons; if they are to become persons they must be treated, to some extent at least, lovingly. Otherwise, they become monsters. Only love can create a healthy personality. The compassion of Buddha or Ghandi was immensely creative. The creativity of the divine love is the unsurpassably perfect and cosmic form of the creativity characterizing love in general.

Charles Kingsley imagines God saying, "I do not (simply) make creatures, I make them make themselves". There is literal truth in this. All love acts in this way. Parental love (supplementing other environmental as well as inner bodily influences) does not simply make the prepersonal infant into a real person. The infant must respond to the love with its own dawning love. Thereby it (partly but genuinely) makes itself. In correct English we say that we "make" decisions, plans and that a poet makes his poem. What is a person at a given moment without his or her active response at that moment to perceived events and remembered past decisions, plans, adopted purposes, thoughts, experiences ? Jules Lequier, addressing God, wrote, "Thou hast created me creator of myself". Some other philosophers and theologians have recently come to this insight.

What does God do in or to the universe ? Above all, he makes it possible, and in the proper sense creates it, as a universe. The many processes harmonize together sufficiently to make a coherent cosmos rather than an unthinkable chaos. The laws of nature sum up this coherence, and the laws are true "acts of God". In short they are laws and there is a Lawgiver. The laws still allow creatures, not just human creatures but all creatures, some freedom or power of decision-making. Hence the statistical nature of laws as science now conceives them.

The primary form of creativity is in experiencing itself as such. The multitude of stimuli, extra-bodily and inner-bodily, and memories of the past are the given factors to which an experience of the moment is one single response. "The many become one and are increased by one." In the new unity each given item must be embraced in a new synthesis. Determinism would have to mean laws uniquely specifying the exact relative prominence and distinctness or subordination and indistinctness of each item in the new perspective. No such laws are to be found in the books.

According to the physicist, Karl Popper, whereas when physicists discuss determinism they have fairly precise ideas on the subject, when psychologists discuss it "all precision vanishes". An example might be B.F. Skinner's idea of "reinforcement", which is the probability of an action (how precisely identified?) as increased or decreased (how much?) by certain stimuli (how precisely measured?). This seems far from strict determinism.

Niels Bohr and some other physicists have suggested that the Heisenberg uncertainty principle is only the first, but probably not the last, or most relevant to psychology, of the qualifications to be placed upon the classical deterministic idea of causality.

In "process metaphysics" or "neoclassical philosophy" there could not be a strictly non-statistical, precise regularity in nature, even for the behaviour of "inanimate" things. In every singular actuality there is a decision among otherwise open possibilities, a decision whose exact preprogramming or absolute control is a logical impossibility. Hence the divinely maintained coherence or orderliness of the world is not absolute, exclusive of all disorder, conflict or frustration.

Many ask, "If God makes all things, why is there suffering and wickedness?" The honest answer is, because God's love is for free creatures who must share in their own creation. If each creature partly makes itself, there is risk of conflict with others, hence suffering, inflicted either innocently or with bad intentions. The self-making of creatures cannot be infallibly wise or infallibly good. Only God can be either.

Not simply human beings have some power of self-making, all creatures do, according to some thinkers (Peirce, Bergson, Whitehead). Current science no longer denies freedom even to atoms. However some philosophers reached this view before science. These philosophers have also held that there is some form of feeling and sympathy (Whitehead: "feeling of feeling") in all the active agents in nature (particles, atoms, cells, animals). Our bodies are societies of cells, each an active, integrated individual. The principle is, "What acts as one, feels as one", and it responds to the feelings of others in some degree. On this view, love in a generalized sense is universal. When our bodies move in accordance with our feelings and decisions, it is because our cells are sensitive to these feelings or decisions. This, with appropriate qualifications, is analogous to our responding with unconscious sympathy to divine love and its decisions. The reverse relation that our cells influence our thoughts and feelings is explained by our unconscious sympathy for the weal and woe of the cells. Hurt my cells, and you hurt me; when my cells flourish, I have a feeling of at least mild pleasure. Not a single fact known to science clearly conflicts with this view, and countless facts seem to support it. It is not a common sense account, but then what does common sense know about atoms, cells and the like? The nature of matter is a deep mystery to mere common sense.

One implication of the above explanation of the universal role of sympathy, that is, of love in at least a minimal form, will trouble some. This is the idea that God responds sympathetically (in this case consciously) to our feelings of joy and sorrow. The idea of God the Father suffering was traditionally taken as a heresy (not by Origen however). In our time many (Berdyaev, Whitehead, Garvie, Kitamori, etc.) think otherwise. To deny divine suffering is to destroy any genuine analogy between divine love and creaturely love. But without such analogy it is equivocation to speak of divine love. Jesus suffers on the cross; can the Father be without sympathy for the Son ? This has long been a problem for theology. The Greek emphasis upon eternal forms and the idea (Aristotle, Philo) of the unmoved mover may have unduly influenced the fathers in their rejection of patripassionism (the doctrine that the Father suffers).

No attempt is made above to construe the traditional doctrine that divine creation is "from nothing". Any experience we can have of creating is of one state of the

creation. But what facts of science, what arguments of philosophy, what verse of Scripture, reasonably interpreted, could justify the assertion that God's creativity is to be measured by a finite rather than an infinite past time of creation ? Our concern is with the creative advance from one state of reality to another. Our type of universe may very well have had a beginning and may have an ending as well, but who can assure us that is was made out of nothing? And who can assure us that it was made out of a previous created actuality? Process philosophy views the difficulties of an absolute beginning of creation as the decisive ones. But the question brings us close indeed to the limits of human understanding.

One thing is to be granted, that without God we should be nothing and the world would be nothing. But then the words "without God" are an absurdity. God does not happen to exist, and "could not exist", as the Socinians said long ago. So why ask what we could be without God? The argument is that without divine inspiration and ordering influence, creatures could no more coexist than a group of infants could teach themselves or each other to become persons.

The truth is that new possibilities for interpreting divine creativity and love are now available, both in science and philosophy. These new possibilities are what "process theology" is trying to develop and communicate.

A word about providence. God gives the world the possibility of existing as an orderly cosmos, or as anything coherently thinkable. But the final action of divine love is not what it does to or in the world but what it does with the world. God cherishes the world and thus makes it contributory to the divine life itself (Berdyaev, Tillich). The ephemeral creatures thereby acquire everlasting significance, which they could not do simply through themselves or their fellows.

For some centuries theologians have been making things easy for atheists. There have been the obvious failures, such as bungling treatments of the problem of suffering and evil. Less immediately noticeable, but of fundamental significance has been the inability to develop language which modern man can use in thinking about God's involvement with the world. There are resources within the religious tradition, in understanding of God as love, which can be used to remedy this, but which sadly have often been overlaid with other emphases, or so interpreted as to evacuate them of real content. That time we may hope is passing. It is not impossible for human beings to rise to the conception of eminent freely creative love cherishing creatures whose very essence is their being humbler forms of free and creative love, with all its dangers and all its opportunities.

C. Humanity, Nature and God – Three Realities or One?

Is the universe a unified single system, or a manifold group of systems, wherein man, other animals and plants, and inanimate nature are all different systems ?

Human knowledge, in its various disciplines, has always been an attempt to relate the parts of the universe to each other. Even myth and ritual are such attempts. In modern science there is a desire to unify all knowledge through a single field theory which brings all the levels and dimensions of obscured reality into its scope. Similarly there is an attempt also to understand all reality in terms of the laws of one discipline – say physics or chemistry. In Marxism there is a similar attempt to unify all reality through the three Laws of Dialectics.

The fact that none of these efforts has fully succeeded in unifying all reality may mean either that our theories are deficient, or that we do not have as yet sufficient data to bring everything together under one unitary conception, or again that the universe is not really united. Whichever is the case, neither field theory nor reductionism would be able adequately to explain the human reality in all its complexity. It is by placing the knower somehow outside the object of knowledge that physical science in the past has sought to understand the universe objectively. A field theory which unifies reality by leaving out the human being and his complex aspirations cannot be the last word in human knowledge. Would such a field theory be able to explain human history and human hope? Christians would add – would such a field theory take into account the reality of God, or would he still remain an unnecessary hypothesis in the Laplacian sense?

The fact of the matter is that the unifying conception of the universe is always a human act of creativity. Such a unifying vision of the created order is provided usually by religious world views or secular philosophical systems.

Whether it is a religious or a secular view, humanity comes into it as more than a subject standing apart from the objective world. The evolutionary hypothesis sees humanity as emerging from the material world in process, relating itself to it not only in terms of origin, but also as resuming within itself aspects of the world – material, vegetative and animal. Even a philosophical view such as Husserl's Phenomenology, which starts by bracketing out the objective world, finds the world as contained in his consciousness. Nuclear physics is coming to the conclusion that the observer is an integral part of the reality that he observes. The observer is also participator.

The separation between subject and object which was once the essence of the scientific enterprise seems useful only at macro levels of observation. The universe does not consist of distinct objects spread out in time; it turns out to be a pattern of inter-connected events of which man himself is an integral part as he observes, understands and changes the world.

There is also a commonsense level at which we can understand our integral human relation to the universe. The following aspects seem to be obvious:

a) Human beings were produced in the course of creation or evolution from the elements of the material world. As the New Testament puts it, "The first man is from the earth, earthly" (I Cor. 15:47).
b) Humanity recapitulates in itself material elements, vegetative elements and animal elements. It shares with the rest of creation a body in time-space which obeys the same laws as all the other levels of earthly existence.
c) Humans are dependent on the elements of the external world without which we cannot live – the food we eat, the air we breathe, the sun on which the biosphere depends for its energy supply, the delicate eco-balance on our planet so essential for sustaining life – all these are integral elements of our being. Without matter and the life of plants and animals, there is no human existence.
d) We humans depend on work for our sustenance, which is a way of interacting with the external world. The health of our bodies and minds requires this interaction with the material world.

This integral relation between humanity and nature has often been partially overlooked in the attempt to understand nature (a) as object and (b) as the creation minus humans. Only a unitary vision of humanity as an integral part of creation can be faithful to the reality we know. To think of the non-human world as something which is out there, to be an object of our scientific knowledge and technical manipu-

lation, is not only wrong, but has disastrous consequences, as the ecological crisis is already showing. We are part of the eco-system, and our actions, by their impact on that system, can be self-destructive if such actions do not have regard for the system itself.

But are humanity and nature the only two realities that we need to take into account in their inter-relation? Can we understand the man-nature relationship without reference to anything outside it? Secular thought so believes. Modern science and technology have developed in a secular atmosphere where only humanity and nature were taken into account. The successes of science and technology in explaining and changing the world have reinforced the secular philosophy which believes that the universe can be explained in terms of itself without reference to a creator (the 'unnecessary hypothesis' of Laplace).

The attempts of intellectually respectable philosophers and theologians to make God a necessary hypothesis have ensured only a *deus ex machina,* a God outside the machine of the mechanistically understood universe. The question, "Why is there a universe at all?" has been dismissed as unanswerable and therefore as irrelevant. Philosophically respectable interpretations ascribing the source of creation and creativity to a Creator God (e.g. Whitehead), despite the philosophers' adequate knowledge of science, have generally received a bad press. Theology itself has been tempted to abandon the 'unnecessary hypothesis' of a Creator God, and has proceeded to give 'secular' interpretations of the Christian gospel. The 'observable' realities of man and nature are affirmed to be the only two realities that exist, since they are the only ones to which we can point.

Why does Christian theology resort to such extreme measures, contradicting its own nature as theo-logy, the reasoned discourse about God? We suggest that theology itself is to blame in large measure. Not only because it has often stood in the way of scientific progress, but also because it fails to incorporate adequately the knowledge gained by science into its interpretations of the nature of reality; and because it conceded to science an absolute autonomy and a monopoly of knowledge which few scientists would claim today. Perhaps also because it over-emphasized the transcendence of God in an almost spatial way, dissociating God from the life of humanity (regarded as totally sinful and therefore totally alienated from God), and because it dissociated salvation history *(Heilsgeschichte)* from the history of humanity and nature.

Today Christian theology seeks to overcome these errors of the past. The Christian vision of God attempts to bring all reality together in interrelationship, without blurring the distinctions. God is no longer seen as a reality 'outside of' or apart from the reality of humanity and nature. Humanity and nature can exist only in God. They cannot be outside God for God has no outside. Only finite entities, beings with boundaries, can have an outside. Outside God there is nothing. All that exists, whether humanity or nature, exists only in contingent dependence upon God, whose loving will sustains it in existence. God, humanity and nature are thus seen not as three separate realities, but as one reality – the fundamental reality of God upon whom all other reality depends and from whom created reality is derived.

This is not to blur any of the distinctions, as has been said. The tensions remain, between God's transcendence and his involvement in the creation, between God's 'is-ness' which is self-derived and *sui genesis* and the is-ness of created existents, between divine creativity which brings all existents into being and sustains them in existence and the creativity of humanity which depends upon God's creativity and can only shape and give form to what is given.

There is a further problem – the problem of sin and alienation – in this unitary vision of God, humanity and cosmos. There is presently no harmonious unity between the three. The myth of the Fall refers to a rupture in creation, a revolt of humanity against God, of nature against humanity. The ecological crisis can be seen also as a pointer to this unity yet to be achieved. But are not the two revolts inter-related, and can one be solved apart from the other? Alienation exists, from the human perspective, at many levels – humanity from God, human being from human being, humanity from nature, and even man from his own true being. The overcoming of this alienation is the drama of creation, fall and redemption, in which the present ecological crisis constitutes one scene.

The drama itself goes on, and will probably go on after the crisis of ecology and the crisis of human justice have been overcome. We of the present generation must play our God-given role in the present scene of which the crisis of justice and the crisis of ecology are the two main elements.

God, humanity and nature – their unity affirmed by faith is also the object of the Christian hope. Hope realized is no longer hope. Hope, however, moves us on.

D. History, Nature and Grace

A first unreflecting judgement might be tempted to define history as simply the sum total of events. But if this were true, history could be of no interest to us, because it would be beyond our grasp. To record in full, with audio-visual equipment and written documents, no more than one case study of the death from pneumonia of one of society's derelicts, in all its aspects, would fill volumes. To find a pattern in it, 99,9% of the information would have to be jettisoned; and on the remaining one-tenth of one percent the historian would have to impose his own interpretation. Another student, interested in other aspects, could make a different case, no doubt. But either of these would be history in a more relevant sense: the tracing of a series of events in their contexts in such a way as to give them meaning.

To give them meaning? Surely the good historian does not give meaning, he discovers it! But nothing has meaning except to a mind. For history to exist there has to be the conjunction of event and mind. Events do not have a total, universally valid meaning which someone then discerns, even though groups of events will have their individual meanings at the time for those involved in them. Mind arranges events in the *Gestalt* of overall meaning, in order to appropriate them, make them part of its own consciousness. It does not, of course, attempt this in detachment. The mind of the observer is an aspect of his personality which is itself shaped in part by the world in which he lives, and can never wholly escape from his own heart and history. Likewise the events which he studies change him even as he responds to them. For all these reasons a particular historical thesis pattern may prove to be an inadequate interpretation; it may give an impermissible colouring to the 'facts' which it includes, incorporate alleged facts which never actually happened, leave out too many facts, misrepresent relations between facts, and so on. History can be subjected to truth-testing, though of a fairly elaborate sort in most cases. A so-called fact may of its very nature be susceptible of more than one justifiable description. But in the end history is a way in which a rational observer relates to experience, his own or that of others. History is not a definable sphere of reality 'in' which things happen.

When, therefore, theologians talk, as they – especially biblical theologians – do, about God's being active in history, what do they mean? Simply that someone, themselves perhaps, or more probably a biblical writer, has

found it impossible to describe successfully a series of events, to give it an acceptable pattern, without positing God as an active factor in that pattern.

Now it will be obvious that this situation can arise as easily in respect of what we loosely call 'nature' as of the record of human societies. There is nothing absurd in writing a "History of the Solar System" just because the subject is only marginally concerned with human life, or, so far as we know, intelligent life of any kind. Nor is it absurd to see in a history of the evolutionary process as this has unfolded on this planet a pattern which suggests the involvement of God with that process, even though humanity appears only at the very end of it. Only two things are essential for the concept of history to be operable: first, the understanding of reality as essentially inter-related by the matrix of time and space; secondly, man, not as subject-matter but as historian. The concept of history, like that of nature, is a label for a way which human beings have developed of understanding reality.

We can, however, push a little further ahead in attaching meaning to the phrase, "God acts in history". What this also implies is that it is when we are engaged in the task of interpreting reality as history that we have an especially favourable opportunity to discern God's action; that it is in this context that we are most likely to need him to be able to develop a satisfactory pattern of interpretation. Further, we might say that there are certain aspects of God, possibly the most important aspects, which we shall not be able to discern except when engaged in this activity. History, in the sense of reality viewed in this kind of way, thus becomes a necessary medium of revelation.

What is completely ruled out on this understanding (of the terms) is any idea that history and nature are mutually exclusive. They cannot be, because they are concepts of totally different kinds. But equally the realities to which they refer are inseparably entwined. Both the historian and the raw material of history are embedded in the order of nature. The limits of the historian's understanding are dictated by nature. Without nature there is no history.

Nevertheless, it is important to stress that, although there is no competition between nature and history, it is history which is the more important for the realization of the highest levels of existence in the world. To give some examples: first, if I am to have any adequate understanding of myself, it is necessary that I see my own life as history, that I discern in the material offered to me by memory and by external evidence a meaningful pattern which is not an indefensible interpretation, but appropriate and creative. Again, in the sphere of the sciences, for the most valuable understanding of nature we have to develop patterns of interpretation not merely for the microcosmic, where time and space become problematic, but also for larger organizations and inter-relations, where sequence and development are of the essence; in other words, the category of history is essential if we are to have a right relation to nature.

The customary distinctions, therefore, between God revealed in history and God revealed in nature are imprecise. Where we find God revealed is *in nature and humanity historically perceived.* (In this connection it is worth noting what we have said elsewhere, in our account of the insights of process theology, that the involvement of God with creation at the microcosmic level is in fact something hypothecated by extrapolation downwards from more complex levels, that is, that even at the sub-atomic level it is still through the medium of historical interpretation that we find God's presence indicated.)

This means that crucial importance attaches to the quality of our historical interpretation. It is a matter of common observation that human efforts at historical perception can be tragi-comic in their inadequacy. We are all aware of the way in which popular tradition in a nation perpetuates very often a complete travesty of reality as the accepted version of that nation's history; and it is a great sign of maturity and seriousness when a people can reject one version of their past and replace it with a better, as Germany has done since 1945, for such highly tendentious popular histories serve a fundamental psychological purpose. They are an important vehicle of identity, a means of creating national self-confidence.

In the construction of a history it frequently happens that emphasis is placed on some element, now seen as critically significant, which before was passed over as utterly without account. The death of a social derelict, from which we began, might superficially be regarded by the unthinking or conventional as without significance. But a different interpretation of the facts might well present it in a light that makes it central, a judgement on the current order and a demand for the future. Likewise nothing can have seemed less significant in Rome in AD 30 than the crucifixion of Jesus. But on any estimate this view has been proved wrong. It does not, of course, take much intelligence to see that it was wrong after the world's course has been affected for nearly 2,000 years by the consequences which flowed from that event. What was really remarkable was to be able to perceive history at the time in such a way that this minor incident was recognized as a turning-point. In a wholly unexpected way the future turned out to belong to those who had eyes to read history in that way and to all who were convinced by them.

One major reason for the power of this new reading was that it did not confine itself to interpreting the Jesus-event, his life, work, death and resurrection, in isolation. Jesus was presented in the context of the Old Testament, which is itself, among other things, a historical perspective not only on Israel but, through Israel, on the whole human race and the very cosmos. This was understandably an immense aid in communicating the new vision to those who had also been formed by that history; and so long as, through the authority of an infallible scripture, this history was so accepted by the non-Jewish world, the vision retained its force for them also. If Jesus is to have significance for the world today, one need is the writing of a new salvation-history on the scale which science has now made the only meaningful one, namely one which comprehends the universe in the extension in space and time which we now know it to have.

But we cannot leave it even at that. It would be equally a failure to read history adequately if one were to say that the course of events was going in a certain direction anyway, and that Christians were simply those who caught the wave and rode it. It is true that no vision or message has much success unless the times are ripe for it. But where a vision both satisfies the human mind and fires the heart, that vision itself is an enabling factor, inspiring and empowering human beings in a way that changes the course of events. The classic instance of this in modern times is Marxism. Whatever early Marxists may have thought about the 'laws of history' and the possibility of predicting the determined course of events and going along with it, it is now clear that the Marxist vision itself has been a new factor for change in many different ways which have made it necessary to modify the original predictions.

The Christian reading of history, however, had yet another dimension, for it said that the true interpretation of events demanded the inclusion of God as the central factor, and identified the locus of God's involvement as Jesus. In working out the full understanding of this, it arrived at a conclusion which then became a valid framework not just for one particular series of events but for all events for all time. For the Christian reading of history did not just say that

events could only be adequately interpreted by introducing God as already known into the account; it went on to say that the full interpretation revealed a new and deeper conception of God. The truth in this conception then presumably remained true for all new situations. Even if new insight into God were one day to be vouchsafed, nevertheless it could only build on the one here given, not contradict it. From now on God would be for all men the loving God who had shared human existence.

In this way a particular sector of the created order historically perceived became the vehicle for a vision of reality valid for all sectors. And because this vision was one of a gracious God, history became the means by which grace, the assurance of liberating, empowering love, came into the lives of men and women who had no personal direct contact with the primal history itself. Again because the vision was of a God who involved himself in the world of nature and man, the creation, who shared the situation of his creatures, there was no future situation conceivable from which he could be thought to be detached. Furthermore, the creation itself was now seen to be an adequate vehicle for the expression of God's essential self, and so acquired a new dignity and was seen as having a new potential. Finally, for those who themselves possessed that human nature in which even God was able to be himself, there came a new vision of the possibilities of humankind and a faith in human capacity to realize them.

Thus through creation, historically perceived, a spiritual power was released which could in time transform, through humanity, that same creation. It is in this perspective that the relation of history, nature and grace needs to be conceived. We do not here have three separate spheres with the consequent problem of bringing them into organic relation with one another. Grace is the transforming power of love experienced when creation is historically perceived in a way that does justice to its reality.

But no one comes to this perception as an isolated individual. We must say even of Jesus that as genuinely human he found his gospel as a member of a particular human community, probably the only one in which precisely that insight was possible, and that it was as a member of that same community that he was able to communicate it with life-transforming force. Incarnation, if it is to be real, must mean incarnation not just in an individual life, for there is no such thing, but as person-in-community, in a web of relationships and in a context of a shared history. And the same is true wherever the grace of God comes. It does not descend from heaven to make its way into the individual personality by a transcendent, un-contexted miraculous act, but comes through creation and society which have in a hundred ways prepared its access, ensured that it will have meaning, and, most important of all, given it concrete reality. All beings are, or can be, grace to one another; and the medium which ensures that this grace will be the grace of God in Christ is the history that links us to him. This history is not a bare intellectual construct, even if it is necessary for a fully conscious faith that the mind play its part in recognizing it. It is something made up of every constituent element of life. The world and its creatures, all the good that men and women have done and the evil they have endured (and, above all, forgiven), the life of home and society, the beauty of art, music, literature, the symbols and rituals in which are expressed convictions so deep that we give up the attempt to translate them into words as pointless, all these as well as the verbal expression of our world-views contribute to the history in which we are embedded and to which we respond, and as such constitute the media of divine grace, incarnate in and working with the created order.

One final point must be stressed. Christian theology has normally insisted that grace flows into the world exclusively through the Church. But this position cannot be sustained, even on the premisses of theology itself. By becoming incarnate, God unites himself to the total history of the creation, not just to that selection from it which can be logically linked to the phenomenon of the identifiable Christian community. The Son becomes not a Christian but a man. The Church exercises (or ought to exercise) a unique role in the economy of salvation because it consists of those who are consciously aware of this unique divine event, and are therefore charged by that awareness with bringing the rest of humanity into full conscious relationship with the grace present in our common history; and all men and women in their humanity possess something which, though defective in various ways, is yet a mode of existence in which even God could be true to himself. It is by virtue of this fact that all mankind, in its multiform historical actuality rooted in the life of the whole natural order, is an agent of God's grace to the persons-in-community who make it up.

III. THE BIBLICAL INTERPRETATION OF NATURE

A. Nature

There is no semantic equivalent in *OT* Hebrew either for the modern concept of nature or for the ancient Greek concept of *physis*. This is true not only of nature as idea, but also as aggregate. The characteristic Hebrew method is to indicate the totality by listing its main ingredients, e.g. "heaven and earth and sea". We do not even find "all things" as an equivalent for our term "universe".

What we do find is the phrase "all (God's) works". Earth and heaven are never thought of as autonomous entities. They are always seen as inseparably linked with God in the great cosmic community. God is not equated with nature; the OT is not pantheist. But neither is he the wholly other, the remote and transcendent; the OT is not deist. God is intimately and enduringly involved with nature. He is Creator, but not in the sense of a mere initiator. Through his 'word', 'wisdom', 'spirit', 'name', 'hand,' he is continually active within it and responding to it. Likewise no creature is independent of any other or of God. Man (*'adam*), the ground (*'adama*), plants, animals, birds, fish, the earth, the sky – all are mutually involved, mutually influenced.

God's place in this cosmic community is unique. Even the highest heaven cannot contain him, but he fills heaven and earth. His relationship with the cosmos is at once defined and wrapped in mystery by reserving to him the word *bara'*, 'create', which is never found with any being but God as its subject. This divine creativity is unique. It is not *ex nihilo* (that is an idea that enters with Greek thought), but it is fundamental in an ultimate way. Thus, God does not work within given frameworks of space and time; he creates those frameworks. Before creation there is only chaos, devoid of either dimension or direction. Again, the time-scale is something instituted only on the fourth 'day' of God's creative work.

It is part of God's total understanding of and permanent involvement with his creatures that he relates to each of them in the appropriate way. By so doing he constitutes them into a hierarchy: the hosts of heaven – the stars – humanity – animals – plants – the earth. Within this cosmic hierarchy the last four levels form the community of earth; and within this community humanity and the animals go together as a distinctive group, that of beings who can be

described as *nephesh* (conventionally, 'soul'; more accurately 'living individual'). Only these are said to be alive (*hava*). This is not because all others are thought of as inanimate, far from it. The *'adama,* ground, from which man is formed, is itself living and active; plants reproduce their kind, and so on. But animals and humanity have life in pre-eminent fashion; an animal is an individual living being, and as such closer to humanity than any other creature. Even so, it is not an equal partner and companion. Humanity comes distinctly at the head of the earthly community.

This understanding of the earthly community of creatures is possible only because the OT has demythologized nature to a degree unique in the Ancient Near East. The counterpoise to the fact that man is an integral element within the community of earth, himself a part of nature, is that the other creatures are not divinized. They are not, as in Mesopotamia, for example, manifestations of competing spiritual powers. God alone is sovereign and he is one. Creatures are themselves, and subordinate to him at the proper point in the hierarchy. This gives man freedom from *Angst,* so characteristic of Babylonian religion, because ultimately he has to deal only with one controlling power, God, and God's character is known. The relations of all creatures to God are set within the framework of a covenant, made with all flesh and with the earth itself, in which God promises stability to existence.

Covenant in the Ancient Near East and Israel is primarily something unilaterally imposed by an overlord, and carries with it both promise and law. With God's promise of stability go the laws which he establishes in appropriate fashion for each creature: for sun and moon, for migrant birds, for the sea, and so on. But not all creatures unfailingly achieve the goodness appointed for them. Leviathan, the great sea monster, the most magnificent of all animals, may be God's playmate; but he can also be something evil and dangerous. The lion's roar is a prayer to God for his food, a prayer which God answers; but the lion too can be something hostile and demonic, a threat which in paradise regained will become harmless. Of all creatures only the birds seem to get a uniformly good press! And in the primal history, in the age before the Flood, it is not just man whose ways are evil; all flesh has corrupted its way before God and filled the earth with violence, and so all are destroyed.

When, however, creatures fulfil their role, they have two kinds of value. They have value in the community of creation, in their contribution to the interdependence by which the life of all is sustained. But equally they have value to God, which is quite distinct. For this reason life is sacred to God, and the blood which is the vehicle of that life is reserved to God, and must not be consumed by man. Indeed, it is because of its value to God that it can be accepted by him, on his own express permission, as a propitiation for man's wrongdoing. Similarly there are many creatures which have no discernible utility; but God takes pleasure in them. There is here a distinction which seems in some sort to echo our own distinction between instrumental and intrinsic value; but the former in the OT is never merely value to man but always value within the earthly community as a whole.

Within this community man has a special position given him by God. In Gen. I this is characterized 'dominion'. This term has been the focus of much debate in recent years, and is therefore treated in more detail separately below.

Moral norms concern the relationships between humanity and animals as well as relations between human beings. Thus, the blood of animals must never be touched, because through blood they are related directly to their Creator. There are other laws which in the biblical context are signs of man's responsibility for the welfare of animals, e.g. the prohibition against taking away a bird with its eggs or muzzling a threshing ox (Deut. 22,6; 25,4). Righteousness is necessary even towards cattle. Christian ethics needs to work out the detailed manifestations of the spirit of these norms in ways appropriate to our own time and place.

Heilsgeschichte, 'salvation-history', is something that unfolds within the framework of creation as a whole. The promised land is far more than a mere place to live. It is the ground on which life in *shalom* ('well-being', 'peace') becomes possible, the basis of a religious as well as of an economically adequate existence (*menuha,* 'rest'). But as a kind of living entity the ground belongs ultimately to God, and Israel must free it from service time and again (Lev. 25).

In spite of God's enduring creativity, *sin and alienation* have entered human life. They originate with the first man and spread and develop. But to say that the fall of man entails the fall of nature is to over-simplify the biblical understanding. The basic laws of nature are a framework of time and space which mankind can never destroy. Nevertheless the effectiveness of God's blessings and curses is based on the presupposition of an insoluble connection between human behaviour and the 'response' of earth, although not in a simple casual way (Deut. 28f). The sin of Adam and Eve incurs the lessening of earth's spontaneous abundance (Gen. 3); the ground refuses to give her strength to the sinner Cain (Gen. 4). Sin always involves some kind of loss of 'earth'. Alienation from God goes hand in hand with alienation from nature.

To break the ban of sin and its consequences the rites of *propitiation* are conceded to Israel. By the vicarious death of ox or sheep its master can be rescued from death. Only in this case man may use the blood for his own purpose.

The prophets, however, maintain that the sinfulness of their fellow-countrymen has been intensified to such a degree that no propitiation will save them. The coming catastrophe will bring not only illness, death and destruction of the human community, it will bring also the loss of the promised land as basis of life and welfare (*shalom*).

For the prophets God's aim with his people (and mankind) is salvation and a new *sedaga,* 'righteousness'. Judgement is only a transitional stage and may be falsified by Israel's repentance. At last creation will be completed in a *new heaven and a new earth.* Then not only alienation between man and man or man and God, but also alienation between man and animal will come to an end (Is. 11). But this raises the whole question of eschatology, which is one of the most difficult of the biblical categories for us to use today, and is therefore given more extended examination below.

By contrast with the OT the New Testament has relatively little to say about nature. The reasons for this are partly fortuitous, partly sociological, but also inherent in the nature of the primitive Christian community and its world-view. The fortuitous reasons arise purely from the scale and character of the NT material. The volume of the NT, to start with, is only 30% of that of the Old. The bulk of its contents falls within a period of forty years, and the outside limits of its dating bracket only a century, compared with the nine centuries between the earliest and latest passages in the OT. The NT is the work of a relatively small community with highly selective interests, whereas the OT is the product of a whole nation, a minor one certainly, but always much larger than the Church in the NT period, and inevitably concerned with a nation's wider issues and situations. Hence it is no surprise to find in the OT far greater diversity of types of literature than in the NT. There is nothing in the NT, for example, to parallel the large collections of 'observations on life and world-order' which we call the 'wisdom literature' of the OT, or its extensive range of liturgical poetry, or the detailed corpus of its laws on what we would regard as

secular matters. The very types of material, therefore, in which an attitude to nature might be most likely to be reflected are precisely those which are missing from the NT.

Sociologically, it is hard to escape the impression that most of the NT writers are 'urbanized', compared with the predominantly agricultural orientation of the mind of the OT. The Gospel material, especially in the teaching of Jesus, with its use of images from nature and the husbandry, is nearest to rural society and to the world of the OT; James is thought by some scholars to be addressed to the Palestinian Church. But otherwise there is little sign in the writers of any attention to nature; and their audiences, where known, are almost exclusively urban. While it is true that this would not have been as strong a distinction in the Roman world as it is in our own megalopolitan culture, nevertheless it is probably fair to say that nature was not one of the things in the centre of the mental focus of the early Christians; and this is partly related to their sociological classification.

There were, however, other reasons, inherent in the earliest Church and its Gospel, which conspired to minimize concern with the question of human attitudes to nature. The first was the approach of primitive Christianity to Scripture. For Christians of the first century the OT was their Bible, and it alone was the inspired World of God. Primarily, however, the first Christians were interested in the OT as a vast source-book of predictions, some clear, some enigmatic, of the coming of Christ, his nature, life death, resurrection, redeeming work, and heavenly glory, and of the mission and destiny of the Church. Their exuberant and untiring obsession was with the Gospel. They were not, on the whole, interested in the total range of an argument or the total message of a book. These are characteristically modern ways of using Scripture. Given this situation, it can be seen that many of those elements in Judaism which we have been considering were effectively blanked off from early Christian consciousness.

Secondly, there is the fact that the Christian message was initially a gospel of personal salvation. It impinged on ordinary life but primarily at the points of religious belief and personal and social morality. The criticism of much present-day Christian preaching as being still too much concerned with these two things only, instead of having something to say on corporate or global issues, must, if it is to be both honest and helpful, face the fact that in the foundation (and still authoritative) documents of the Church precisely these were the overwhelmingly dominant conerns.

The third and perhaps most important of all reasons is, of course, that the earliest Christians felt themselves to be those "upon whom the end of the ages has come" (1 Cor. 10.11). Since, therefore, the created order did not have long to run, there was no incentive to develop a constructive long-term attitude to nature as it was.

It is clear, nevertheless, and must be said with emphasis, that all the NT writers assume without question that the OT view of the created order is God's work and therefore good. Inevitably, because they lived in a world of Greek thought and culture, and wrote in Greek, this view was largely mediated to them in the forms of Hellenistic Judaism, which added to the OT conception the notion of *creatio ex nihilo* (Heb. 11.3). This is for them, however, little more than an intensification of their sense of God's power and wisdom; there is no sign that they are concerned with any philosophical problems it may raise. Basically, their vision remains that of the great OT themes; that any radical dualism is to be rejected, and that God is closely and continuously involved with the cosmic community: "in him we live and move and have our being".

The Graeco-Roman world at this time, however, was afflicted with a deep sense of pessimism and of helplessness in the grip of fate, conceptualized widely as the tyranny of astral powers. Moreover, Stoicism encouraged many to believe in the ageing and degeneration of the world, which was thought of as declining towards the end of the current cosmic epoch. This degeneration was seen as manifest not merely in man but in the realm of nature. The NT at many points reacts strongly against this assessment of existence, not by denying the situation it expresses, but by asserting that through Christ liberation is at hand. This is perhaps the major new NT contribution to a theology of nature, humanity and God, and may be studied in two main contexts. The first is Paul's brief but densely packed reflection on the state of the creation in Rom. 8.19-23, the second the concept of the cosmic Christ and cosmic salvation in Heb. 1.22f, Col. 1.15ff., and the Prologue to St. John's Gospel. Because these are the principal points at which Scripture seeks to relate the Gospel hope to the creation as a whole, it is desirable to discuss them on their own in somewhat more detail.

We may summarize the main indications for praxis emerging from the biblical utterances about nature as follows:

a) For the biblical writers the determining factors in thinking about nature, as about every other subject, are the all-controlling rights and power of God. "The earth is the Lord's and the fullness thereof" (Ps. 24.1; 1 Cor. 10.26) and this can be carried so far even as to have practical consequences for human social organization, as in the principles underlying the law of Jubilee, that no human being can ever 'own' land outright but must be regarded as a tenant installed by God (Lev. 25.1-34).

b) Under this overall sovereignty of God man does have a position of control over nature, which is approved by God, and which is meant to be exercised in a spirit of respect and responsibility. Skills and technology of all kinds may be admirable, but the tyrannical or greedy use of human power over nature is a failure deriving from human sin, not from God's intention in creation.

c) Man's proper control over nature is made possible because the realization that God is One and Supreme, and therefore transcendent, effectively desupernaturalizes the world, ridding it of superhuman personal power, whether divine or demonic, and placing man in a position to use his powers rationally in dealing with nature.

d) Nevertheless, nature is not to be evaluated simply in terms of human needs and interests; and to think that it is is simply a mark of folly. God created the greater part of the world for its own sake – a point that comes home to us, with our knowledge of the immensity of the universe, even more strongly – and wisdom consists fundamentally in recognizing this and the limitations which it imposes upon us. Technology may explore and exploit nature, but it will never discover the way to 'wisdom' (Job 28). The truly wise man never imagines that he knows fully what God was about in creation.

e) Since God, however, has a moral and rational character, man must in the end submit to things as they are, as a genuine revelation, so far as he can grasp it, of ultimate goodness and wisdom. Hence the careful and comprehensive observation of nature will yield indications for human behaviour which were part of God's intention in creating in the first place, and which therefore have the status of moral imperatives for man. We must ultimately be guided by respect for the intricate character and needs of the natural order.

f) If we are so guided, then we may hope even to improve the condition of nature, which does not as yet embody God's character as human beings have come to know this through their communion with him. Nature is not perfect; there is a

work of salvation to be done in it, as well as in humanity, as part of God's eschatological purpose, and this salvation is part of man's responsibility for it.

B. Human Dominion

Among Christians the question of the relationship between humanity and nature used to be a part of the doctrine of creation. The creation story found its classical expression in the first chapter of the Bible. Here the relationship between humanity and nature is established by a blessing of the Creator himself: fill the earth and subdue it, rule over the fish in the sea, the birds of heaven and every living thing that moves on earth. Regarding this sentence and its impact on the Western tradition there has been some dispute in the last decade. Some theologians have stressed the measure of demythologization which lies behind such a commission. In all other cultures man was restricted in his intercourse with his environment by respect for a lot of mythical entities which were believed to be around him, and by many rituals corresponding to these. In Gen. I, however, a unique *Weltverantwortung* is transmitted to mankind. This lays the ground for the incredible development of natural science in the West in modern times. But others like Lynn White believe the contrary and challenge those theologians who interpreted Gen. I as the separation of mankind from all non-human beings and the transfer of a god-like power to human will and exploitation, from whence comes a Christian arrogance towards nature. This, it is said, is the historical root of our environment crisis today.

Certainly both positions minimize the complexity of a large historical process. Nonetheless the present crisis calls for a new description of the human ontological position and the ethical values of man's scientific and technological attempts to change the surface of earth. In this regard a new approach to Biblical and Christian tradition is necessary, in church as well as in theology.

The concept of the dominion of humanity over earth should not be viewed apart from the corresponding understanding of God. The characteristics of this dominion can be explained only if the relationship of humanity to God is taken into account. The decisive point is that humanity is created in the likeness and image of its creator. *Human dominion over earth* is always conceived as a *function of God's dominion over humanity*. For dominion over earth is another thing than pure administration; it includes creativity. Corresponding to differing doctrines of God there are very different views of human dominion in Church history:

a) When God is thought of as a kind of omnipotent dictator who puts his laws on humanity for incomprehensible reasons, then humanity may also be thought of as an unlimited dictator over the beings and resources of earth (cf. Max Weber on the rise of early capitalism in Protestant societies).

b) If God is purely transcendant, observing or judging his creatures only from outside, then it follows that the human essence is its immortal soul which has in principle nothing in common with sub-human beings; he may condemn or raise them up as he may choose to do; the consequence is to neglect the world and all in it (the Gnostic view).

c) If God is considered as working at his creation even "on the 8th day" pushing it forward to its ultimate destiny, then dominion implies human involvement in planning and shaping history (Pannenberg).

d) If the universe is conceived as contributory to the divine life and God behaves sympathetically with all his creatures, humans too should be compassionate to all beings around them (Hartshorne).

These are only a few examples. But the selection is sufficient to prove the thesis that there is no adequate statement about man's dominion without a corresponding statement about God's dominion. Reference to Gen. I, 28 is not enough; this verse must be taken together with I, 27 and the whole context of creation.

In Gen. I God is thought of as creating by language, and by language he puts his blessing on the course of history. In the hierarchy of space and time humanity takes a special position because it alone is able to communicate by hearing and speaking with its Creator. Therefore it is blessed with the dominion on earth.

This dominion is not the same towards inanimate beings (Gen. I, 28, *kibbes*, subduing) as towards animals (*rada*, rule). But in both cases it is a continuation of God's creativity, because humanity rules as image and agent ('vassal') of its Creator, and with it starts the process of history.

'Subduing the earth' includes tilling the soil, building houses and changing the surface of the earth. Humanity 'serves' the earth and takes care of it; if man works as farmer (*abad, shamar*), he supports its powers for the use of all its inhabitants. The other kind of human dominion, rulership over animals, includes perhaps using them for labour, but only at a later stage consuming or sacrificing them (in Gen. 9, Exod. 25ff.). Even then the use of blood remains prohibited. So this rulership is a highly responsible one and by no means dictatorship. Rather it is understood in terms of shepherd-kingship according to an Ancient Near Eastern ideal, perhaps the responsibility of a shepherd, so far as birds and fish are concerned. The totality of humanity's behaviour shapes the course of time and the world, and the spheres of influence of its deeds spread out for the fortune or misfortune of all the creatures.

The OT notion of human dominion over earth is taken over by the New Testament. Nonetheless there are in the NT some new viewpoints. They result from the new experience of God which Christ has opened. Love is revealed as God's very essence. Under the old covenant God was experienced as the one who loves his chosen people. But in Christ he appears as loving the cosmos.

It is not surprising that only Jesus Christ were the true likeness and image of God seen by NT writers. For the history of the people of the Old Testament has clearly shown that the dominion of mankind over earth does function only within limits. The growing prophetic experience with God obliges us, more and more, to suppose that God's aim in history will be to set forth a redemption and salvation which will go beyond all that has happened before. The coming Kingdom of God needs a man as God's vicegerent who has been righteous and can be a model for future human life. In this regard for early Christianity Jesus becomes the key figure in human dominion too. Through him God reveals himself as God of love. No wonder that in the NT the reference to Christ as the true image of God mentions also the cosmos (Col. 1,15ff, Hebrew, 2ff). Under the influence of Greek traditions the creation was now considered as *ta panta*. The transition from an agricultural to an urban society resulted in a new sophisticated statement of the relationship between humanity and earth. The dominion over the universe is now connected with the hope of bodily resurrection.

For Christian considerations about the position of humanity within creation the OT framework remains necessary. But the ethical impact of this theme is not to establish whether the love of God, which is revealed in its fullness first in Jesus Christ, is taken into account. It is told that he "was among the wild beasts" in the beginnings of his ministry (Mark I, 22). Some exegetes interpret this as a sign

of the anticipation of the coming Paradise (cf. Is. II). Jesus of Nazareth is not the end of the process God started with his creation. But he is the anticipation of a new earth and a new relationship between humanity and nature (see below, Eschatology).

"Many things are terrifying, but none more terrible than man", says the Greek poet. Human dominion over earth is not a mere article of faith; it is a matter of fact since neolithic times at least. Never will this responsibility be taken from us. But to be aware of it in the right way and to act according to it, that may really be an impact of faith.

C. The Cosmic Christ and Cosmic Salvation

There are points in the Bible which would provide another theological understanding of the relation of humanity and nature, especially those passages which speak of salvation through Christ as cosmic in its extent.

The first of these is Paul's brief but tightly argued reflection on the state of the creation, in Rom. 8, 19-23. The creation is said to be waiting for God's children, the community of the saved, to be made manifest, that is, for the consummation of all things, which in NT perspective is to take place when the number of God's elect is complete. But this waiting is not passive and indifferent; it is a passionate yearning. The creation is pictured as aware of its own unhappy and imperfect state, and longing to be delivered from it; it groans with anguish like that of a woman in labour, as the time draws near for the new age to be delivered. Why is the creation in this state? Not of its own will – it has been subjected to it by God, and the central characteristic of its plight is *mataiotes,* futility; that is, that nothing in the created process can yet come to the destiny for which it was intended. There is a block, a frustration in the history of the world. But the very fact of frustration implies the possibility of liberation, that the world can perhaps go forward eventually to its destiny, and the block be removed. So Paul says that if God subjected the creation to this frustration he nevertheless did so "in hope". The world has to live in hope not fulfilment for the present. What then is it which the world hopes for? Paul's answer is, an end to the doom of corruptibility. In fact, there is a close parallel between the destiny of the world and of humanity in Christ. As humanity is to be raised to a life within the divine realm of glory, where there is an end to becoming and passing away and instead the joy of eternal fulfilment, so is it to be for the whole created order. We human beings are here in sympathy with the creation, for we too long for our entry into glory and the transformation of our own bodily existence. In short, Paul sees no perfection for either humanity or cosmos in their present state. God's purposes call for a new heaven and a new earth.

The second context is one which we may call the concept of the 'cosmic Christ'. This is expressed in various ways in three passages: Heb. 1.3; Col. 1.16f., and John 1.1-4. The content of these three may be synthesized as follows: Christ is pre-existent, a being who from the beginning has been with God and proceeds from God; he was God's agent in the creation of the world, his creative power and utterance, and is still the agency by which the created order is held in being; as the first to rise from the dead, he is the one through whom humanity will itself triumph over death and all things come to their consummation. In addition, in Colossians these ideas are linked with Christ's position as head of the Church, the community of the elect. This theologoumenon of the cosmic Christ obviously has points of contact with the picture in Rom. 8, but there is also one major difference. Nothing is said in these passages of the need of the created order as such for redemption. It is indeed arguable that many commentators have misinterpreted Rom. 8 when they take it to mean that the groaning of the creation is due to the *introduction* of disorder and evil into nature as a result of the fall of man. Nothing more need be implied there than a delay in the progress of creation from its first state of corruptibility to its eschatological fulfilment. Nevertheless Rom. 8 does speak of an evil to be remedied, whatever its origin, whereas Col. 1 and John 1 have nothing to say either way on this point. The thought-forms of these passages are without doubt difficult for us to use. But there does shine through them a conviction that the whole universe, could we but see it, is, in its potential realization, in harmony not merely with some unknown divine power but specifically with God as revealed in Christ. Is there any way in which, in the context of the Bible as a whole, these ideas help us?

What the OT and the NT together seem to say is that, on their understanding of God, the character of the primordial and the eschatological must be the same. There must always have been in God from the beginning that which is needed for him to be Saviour in the end. Christ is "the first and the last", the revelation of the mystery; "the whole universe has been created for him", and "through him God chose to reconcile the whole universe to himself" (Col. 1.16,20). He "is its origin", but also destined "to be in all things alone supreme" (Col. 1.18); he is the one who "himself receives the entire fullness of God" (Eph. 1.23), but who also descended to our world and ascended again "so that he might fill the universe" (Eph. 4.10). Underlying this kind of language is without doubt a view of redemption as *reintegratio,* the recovery of an original perfection which has been lost; this is the synthesis which seeks to reconcile the incompatibles of the priestly theology, for which Eden is something lost, and the prophetic, for which it is something that has never been found. Our own greater knowledge of the history of the universe tends to put us firmly on the side of the prophetic. But theologically we may still find the instinct of the NT synthesis significant, that in God, in himself, there is a fullness and perfection which is unchanging and outside space and time, and that it is this which makes him the proper *telos* for a creation in which the mystery of that fullness is unpacked only through the ages of the evolutionary process, a process which passes through a series of increasingly critical stages and is now precariously poised in a dependence on the rational response of free creatures.

In so far as the crucial factor for the future of nature on this planet at the moment is humankind, the NT claim that the reconciliation of the universe is made possible through Christ has, at any rate, some meaning. In Jesus, as portrayed in the Gospels, we see certain basic attitudes which may seem overly simple but are in fact adequate foundations for an approach to nature. The first is a conviction that the natural order need not be written off as in irrevocable bondage to evil – the apocalyptic view – but contains both clues to the nature of God himself (Mt 5.45) and conditions within which we can learn to be authentic children of our Father in heaven. The second is his equal conviction that we never shall so learn without a repentance which, among other things, learns to trust the existence with which we have been endowed as the gift of one to whom we can say, *Abba.* These basic attitudes do not assume that nothing can be done to improve nature – no countryman would ever be so silly anyway; but equally they presuppose a readiness to learn from nature and to be content with the limitations which, even at its maximum development, it still cannot but impose upon us. The tendency of human beings here as in so many other fields is to say not "What is it wise to do?" but "What do I want?" and to seek to extort that from nature, whether it is feasible or not. Our responsibility towards nature cannot be fulfilled simply by developing our positive

and creative skills; it also involves denying ourselves and taking up the cross daily. Christ as the new Adam transforms the OT conception of humanity's kingship by living as Servant – and not only Servant, but Suffering Servant (Mk. 10.42-45; Phil. 2.5-11). This is now seen as the true "image of God", who is supreme love, and therefore the necessary presupposition of and way into glory (2. Cor. 4.4-6). If, then, our human capacities cast us inexorably in the role of rulers of the world, God's self-identification with us in Christ insists that we must be servant-rulers, and that on no other terms can life ultimately be lived in God's world.

So far, so good. But the cosmic Christ is also presented as the glorified and exalted Christ, and the cosmos is seen as destined to share in that glorification. As is also remarked in the note on Eschatology, this kind of concept is difficult to apply easily in terms of our present scientific world-view. If on theological grounds – for example, the need for an eternal environment to provide the setting for eternal life – it is felt that faith cannot simply abandon such a concept as obsolete, then perhaps little more can be said as yet than that for realization of any truly ultimate goal creation must wait upon the God whose sovereignty always stands behind that of even the exalted Christ, and to whom Christ in the end must himself be subject that God may be all in all (1 Cor. 15.28).

Nevertheless, the NT imagery, in which, though the cosmos is not yet saved, the Christ is already glorified, has its creative relevance for the between-time in which we live. If we acknowledge that the glory of the divine is to be found in Christ (and in the Christ-like, wherever that may appear), then we accept both the demand and the possibility that what we evolve on our drawing-boards, and the social and individual rules (both positive ideals and negative restrictions by which we shape human life-styles), should themselves be sacramental foretastes of the eschatological perfection and breakings-in of that divine glory. And this can be both a powerful spring for action and a transfiguration of the world into a community of thankfulness and praise.

D. Eschatology and Futurology

1. Since the time of the prophets the biblical tradition has viewed the relationship between man and earth, and human dominion over earth, as a temporal stage. "The forms of this world disappear" according to the apostle who clearly in this connection has also in mind the structure of our universe and its hierarchy of species. In our days scientists, especially futurologists, begin to think in terms of the disappearance of whole species and the formation of new ones. Biochemistry and medicine are searching for methods of altering physical and psychical elements of the *conditio humana,* for developing superhuman beings (with a new soul and a new spirit?). Are there not in these and other dreams of contemporary scientists surprising convergences, similar in tendency to the fears and hopes of our Christian fathers? There are, of course, fundamental differences which should not be neglected. Biblical eschatology predicts not only the end of misfortunes and the overcoming of illness and disease, as modern futurology may do; it predicts also the overcoming of death and promises bodily resurrection. Eschatology looks not only for more freedom among men and for non-repressive societies, as optimistic sociologists expect, but looks also for the day when mourning, crying and pain will have gone away forever (Revel. 20,4). The eschatological message contains the victory of divine love within the coming Kingdom of God, reaching every human being and every realm of the cosmos. Futurologists on the other hand present us with pictures of a coming victory of technique on behalf of the glory of mankind.

2. Therefore many Christians strongly avoid every attempt to connect the development of science and eschatological faith. The only possibility is to combine the two in a negative way, and to discover in the products and results of science and technology signs of the approaching end of the world. But in relation to promised positive effects for human life, such Christians declare that these Last Things are God's own work, and provided on his chosen day. Human work is not to be confused with this, not even pious, Christian work.

But the question is, do we really obey our Lord if we let things go their own way? The apocalyptic visions of the Bible (both in protocanonical and in deuterocanonical books) come at some points very near to the development and the dangers of our present civilizations. That holds true in negative aspects, e.g. darkening of the stars from all human eyes, fire on large parts of the earth, extension of the desert, terrible changes in salty and fresh waters, the birth of monsters. But this seems to be characteristic of the positive aspects too: birth becomes painless for women, health increases and the age of human beings is prolonged; a tremendous fertility of the soil means that nobody goes hungry; salty waters are changed into fresh waters for drinking and fishing; a new kind of farming begins without thorns and thistles, etc. Such announcements seem to be promised for the near future. How can that happen? Has humankind dethroned its Creator? Or is the Creator working to assist these developments too? Probably we have wrongly separated the creativity of God from creativity of man in Christian teaching.

Certainly, there is another way which theologians have used in recent times. They have discarded those eschatological notions as mythical, as relics of an ancient manner of thinking, without significance for our faith. Similarities with modern scientific vision are mere chance. Such a judgement brings us back to the body-mind dualism of certain theological schools of the past. Eschatology is reduced to speculations about salvation only for the pious individual. May it not be more appropriate to pick up the biblical challenge anew in our times and conceive that human existence before God and human existence within this world are just two aspects of one great process of redemption? Then the history of mankind, centred in the *Heilsgeschichte,* presupposes the history of nature as an integral part of it.

3. Regarding eschatological salvation biblical utterances are very divergent. Biblical recitals of creation or *Heilsgeschichte* show a higher degree of precision. It is neither appropriate to take biblical eschatology literally nor to take it purely metaphorically. And it would be dangerous to select some biblical passages as the only basis for present eschatology.

What is important is that the boundaries between this aeon and the coming aeon are fluent and nowhere fixed finally. With the coming of Jesus the new aeon has already begun. Who is in Christ is a new creature (Paul). The Kingdom of God remains invisible; nonetheless according to Jesus' parables it is growing up also in our times. Therefore for every Christian generation the task may be a new one – to discern what is our present state in regard to the *Heilgeschichte,* what is our duty in the new future for the building of the Kingdom of God, and what are our eschatological hopes. The purpose of the eschatological predictions in the Bible is not rightly understood if we use them to justify quietistic behaviour. For Christians there is no time to lose. They must begin at once their efforts for God's Kingdom – and that means the weal of mankind – until God starts his last day.

4. Nevertheless every theological speech about the future must be a dialectical one. History is never unilinear progress. Eschatological salvation can never be imagined only by extrapolation from the present state of knowledge. What God will finally create will go beyond every human analysis of the tendencies of development. Bodily resurrection of the dead in a glorified nature as well as the very end of sin and alienation will never result from the efforts of science and technology. The *eschaton* will come in time but it will be also the end of time. It means continuity and discontinuity.

Prophetic pronouncement of the final destiny of man in nature presents a vision and not a scientific discernment. Man needs such a vision of his destiny. More than ever before in our days eschatological faith only presents us the set of coordinates for human activity today and tomorrow. The establishing of a specific and provisional eschatology may be necessary in every period of church history. But certainly it is our task in the present. It is within this set of coordinates that the Christian hope finds new meaning for the achievements of science and technology. Concisely our awareness of the possibilities opened up by science and technology helps us to discern this set of coordinates.

IV. The Contributions of African and Asian Cultures

Christians need not be afraid of learning from all sources – whether secular or religious. Science and technology as developed in the last two hundred years do not exhaust the wisdom of humanity. If science and technology have a right to question mistaken assumptions about reality adhered to by Christians, perhaps other ideologies, cultures and religions should also be allowed to question our ways of understanding reality.

The secular ideology of Marxism lies closest to the Christian tradition, and despite its rivalry and even hostility vis-à-vis Christianity, should be able to engage in a dialogue with Christianity about the man-nature relationship with the possibility of profit for both sides. The major questions that are of interest would be,

a) the integral and the dialectical relation between humanity and 'nature';

b) the laws of the dialectic as they operate on the various levels: inorganic matter, the biosphere, and human society;

c) the ultimate destiny of mankind and the place of nature in that destiny.

It is widely believed that what we once called 'primal cultures' have a great deal of original wisdom to impart to industrial civilizations. This claim too needs examination in dialogue with articulate modern interpreters of the African tradition.

The present crisis in Africa is part of the universal crisis of civilization facing humanity today – the questioning of the fundamental values of the past, and the effort of humanity to remake the world in all sovereignty, without reference to anything beyond man. In Africa this takes several forms:

a) *Tradition:* The younger generation seeks for its liberation from custom and social pressure, from ethical and religious norms. The validity and credibility of the traditional cultural heritage are questioned in the face of the challenges of development and modernity. The secular view seeks the construction of a new Africa by the continent's peoples through an autonomous action without reference to its gods.

b) *The West:* Towards the West, Africa adopts an attitude of legitimate defiance and of mistrust. The West appears to Africa both a danger and a threat – danger that the colonialist attempt to destroy African personality continues to operate; and threat, because of the expressed ambition to possess the world and to reduce other peoples to mere material resources at the disposal of the development of the West.

But that is not the whole story. On the one hand, Africa has the ambition to domesticate Western technology for the benefit of her own development. On the other hand she suspects the technological enterprise of the West as a new instrument of domination and oppression.

Africa has to find her own way. This explains current movements *to strengthen* the deeper dimensions of African life and identity like:

1. negritude and the search for authenticity,
2. the search for an African socialism that is original,
3. the reawakening of the traditional religions and the movement for the indigenization of Christianity,
4. the renewal of African traditional medicine and the efforts of a parapsychic type to manipulate the cosmic forces.

Africa seeks to recover from her own tradition the valid elements on which to build a new African person, a society, an economy, a political life, and a modern culture that are authentically African.

In this context Africa examines the fundamental data of her anthropology and cosmology:

a) Humanity appears first of all as a *microcosm:* human beings, through their spirits, stand at the confluence of the spiritual streams, as well as, through their bodies, stand at the meeting point of the material world. There is a continuity between humanity and cosmos, the cosmos being in some sense a prolongation of the human body.

b) Secondly, humanity appears as *community and crowd.* The human person is not an alien and isolated monad in relation to other human beings. On the contrary, human personhood is a network of vital relations which makes it a microcosm, such as the dyadic relations of man-woman, the triadic relations of father-mother-child and the polymorphic relations of the community and the crowd.

c) Humanity appears thirdly also as *destiny,* as a project, wherein the drama of the struggle between life and death goes on. It is in living out this drama that man experiences his relation to God. This relation is first of all ontological. (The tradition calls God ZAMBA NKOM BODO, the Creator of Human Beings rather than Creator of Heaven and Earth.) But it is also a dramatic dialogue, in which God makes himself the partner of humanity. It is sufficient to study the myths about the origin of death. God plays many dramatic roles in that origin. He lives among people and takes different forms. Human beings would like to suppress God, and God makes himself distant from them for ever. Elsewhere it is told that humanity in revolt against God is punished with death, but at the same time God teaches humans the rite of initiation by which to overcome death. The myth of the creation of woman is also linked to the drama of death. God, taking pity on humanity ravaged by death, creates woman and says: "Men can die, but life shall continue on earth." Thus human destiny is founded upon a dialogue with God which consists of man's refusal, rupture and reconciliation. The consequences of this drama are:

a) God entrusts humanity with the project of life, and links to it the destiny of the cosmos.

b) Humans introduce into it the drama of death.

c) God teaches humanity the secret of reconquering life through death, and entrusts to it the responsibility of ensuring the victory of the projects of the world by the victory of life over death.

Thus humanity recognizes the sovereignty of God as it organizes and transforms the cosmos, the human community

and its own destiny, for the triumph and the victory of life over death.

This relation of man to God conditions his relation to the world in such a way that the two relations have to be expressed in three different modes: ontological, symbolic and liturgical.

Science and technology have an essentially instrumental role, i.e. to help humanity to hominize the world, and to transform the natural relation of man and world into a symbolic relation. And as humanity enters into the dialogue with God, it transforms its symbolic relation into a liturgical relation. This does not occur spontaneously. It is an option or a choice. It does not suffice to say that the African soul is religious. In the historic torment in which Africans live today, the religious destiny of Africa depends upon the choice of Africans today.

African thinkers would therefore propose the following elements for common study and research with others in our world:

1. The human person is not a monad, but a network of vital relations, uniting him to other human beings, to the world and to God. The relations between human beings (ex. man-woman) are founded more upon their complementarity than on the principle of equality.
2. The relation humanity-God is a dramatic dialogue always in process, never completed; humanity is always under judgement before God.
3. The humanity-world relation is a perpetual conquest for the triumph of life over death, that is, for the final success of the project of the world.
4. For us African Christians, the mystery of the Incarnation appears in its double dimension – anthropological and cosmic. Christ has united in himself the totality of the cosmos and the totality of history through the totality of humanity. Therefore the salvation of humanity is also at the same time the salvation of the world.

Asian religions and cultures confront us with a variety that defies generalization. In fact, nearly all the world's great religions are Asian in origin. But there are some fundamental differences between West Asian or Semitic religions (Judaism, Christianity, Islam) and East Asian religions (Taoism, Buddhism, Hinduism, etc).

While West Asian religions generally exalt God above the universe and humanity by strong affirmations of God's transcendence, the East Asian religions show a general tendency to identify the world and humanity with God. West Asian religion emphasizes difference and distinction, while in East Asia the concern seems to be to affirm unity and non-difference. The West Asian image of the Divine Ruler is that of a sovereign enthroned above the world, while the East Asian image is that of a principle that controls everything from within. This controlling principle of the world is often affirmed as being identical with the human soul. West Asian religion emphasizes the separation of God's people from unbelievers, while East Asian religion sees all roads as leading to the same truth and are hence tolerant of others.

These differences are by no means absolute. The rational and the transcendent are not denied in East Asia; nor are exclusivism and intolerance unknown there. But the general emphasis is on the unity of all, on harmony and interrelation, on dynamic continuity between all beings.

East Asian religion usually posits two levels of knowledge, the relative and the absolute, the pragmatic and the ultimate, the rational and the super-rational. Science and technology belongs to the level of the relative and the pragmatic. It is useful and necessary knowledge, but does not lead to deliverance and freedom. It can only deal with every-day reality, and belongs to the realm of the intellect whose function it is to discriminate, to classify and compare, to divide and measure, to categorize and analyse. Distinction, sense-data cause-effect relations, subject-object separation, abstraction of laws, manipulation of things – these occupy the centre of the stage.

Rational knowledge always abstracts from reality those features which can be expressed by laws or qualities. It provides a map of every-day reality which some people often mistake for the reality itself. Eastern religion emphasizes that there is a knowledge which goes beyond natural knowledge – the direct experience of the "undifferentiated, undivided, indeterminate, 'such-ness' of reality", as a Buddhist would put it. Ultimate reality, East Asian religion insists, can never be the object of reasoning or demonstrable knowledge such as we have in science. Neither is it adequately described in words; it is beyond word and concept, beyond reason and intellect. As the opening line of the *Tao Te Ching* puts it:

"The *Tao* that can be expressed is not the eternal *Tao*"

or as the *Kena Upanishad* of the Hindus says:

"There the eye goes not,
speech goes not, nor the mind;
we know not, we understand not.
How could one teach it? "

This does not mean, however, that the rational element in human knowledge of reality is completely denied in East Asian religion. The Buddhist Madhyamika and the Hindu Vedanta schools are highly intellectual. Nor do they deny the validity of experience as such as a basis of knowledge. In fact the philosophy of Sankara insists that it is based on experience more than anything else. But the perception is not sense-perception or conceptual intellection, but 'direct perception' or *aparokŝanubhuti.* Its deliverances are then expounded with a rigorous and highly coherent logic. Buddhism and Hinduism claim to be radical empiricisms.

The schools of Chinese or Japanese origin like *Tao* and *Zen,* on the contrary, show a deep mistrust of reason, basing themselves on the experience of enlightenment or *Satori* or *Nirvana,* which is direct insight. They too thus claim to be empiricisms, based on 'seeing', but not seeing with the optical equipment of man. The environing reality as well as our own self is experienced in a direct way without the filter of conceptual thinking. The description of the experience varies, but is not regarded as very important. It is the experience itself that counts, not its verbal communication to others. Verbal interpretations serve only the function of inducing the same experience in others. Words are often ineffective to induce the experience and resort is made to myth and symbol, poetic images, similes, allegories, *koans,* riddles, *haikus,* paradoxes, deliberate violations of logic, silence, and so on. Modern exponents of Hinduism like Krishna Murthi and the Zen Masters insist that one has to set aside one's logical and rational mode of thought, this incessant talking to oneself about reality, in order to experience reality in its undifferentiated oneness.

This way of knowing clearly does not contribute to our kind of scientific knowledge and has little 'cash value' in terms of getting something out of the world to be *used* for our own purposes. But these East Asian religions claim to fulfil man.

The question then arises, for the modern Asian, how to choose between the two kinds of knowledge. For the one seems to deny the validity of the other. East Asian governments, in carrying out their national planning, find no way of incorporating the knowledge yielded by religious experience into their calculations. Many modern intellectuals, including such towering figures of the recent past as Nehru and Mao, took the decision to eliminate the religious kind of knowledge and experience, and made a conscious

decision to promote the scientific-technological kind of knowledge as the major instrument for overcoming poverty and injustice in their nations. Prophets like Gandhi who emphasized religious knowledge and experience as the basis for the emancipation of the people from suffering and ignorance were largely by-passed. Japan, for example, in trying to modernize society, decided to turn its back on traditional religious values, a decision that many in Japan would like to reconsider. China placed a ban on Confucianism, and traditional Taoist insights have found there no place in the national self-understanding.

This leads to a tension, as yet largely inarticulate, in the Asian soul, between the two conceptions of reality, the one derived from the religious tradition, and the other from modern science and technology. Many East Asian intellectuals seek to solve the problem by holding onto some insights from the religious tradition through rite and symbol, through meditation and religious learning, through worship and religious practice, while adhering with another part of the mind to a scientific-technological understanding and use of the world of everyday life.

The dialogue, it seems, should continue, and even Christian efforts towards an integral world-view can be considerably advanced by engaging in dialogue with articulate exponents of the East Asian religions. The degree to which this is a priority need not depend solely on the cultural context of the Christian community. For after all, the Christian community is a world community. And no part of the experience of humankind need be excluded from the Christian concern for understanding humanity's relation to God and the world.

V. Towards a New Vision of the Relation of Humanity, Nature and God

Our scientific understanding of the universe has made certain cosmologies obsolete. There is now more reason than ever before to reject certain interpretations of the universe associated with deterministic dogmatic theology. By the same token the possibilities are now greater than ever before for bringing together the insights of science and religion into a greater synthesis, that could inspire and guide our struggle for a sustainable, just and controllable world.

A. Elements of a New Vision

SCIENCE AND NATURE. The scientific understanding of nature has expanded our knowledge of the history of the cosmos to billions of years. Aeons of pre-biological evolution were followed by some two billion years of biological evolution and some quarter of a million years of human history. Nature can no longer be understood in terms of the old-fashioned mechanistic models of classical physics. Modern physics and modern biology both call for a deeper understanding of the nature of created entities that takes into account not only the objective but the subjective, the mental, the chance events, accidents, determinism, indeterminism and purpose. Living organisms must be seen as having intrinsic value to and for themselves and for God. This has radical consequences for the way we use nature.

THEOLOGY AND NATURE. Theology faces new opportunities for the interpretation of divine creativity in relation to insights from science and certain philosophical developments. Thus far relatively few theologians are meeting this challenge.

HUMANITY AND NATURE are not detached from each other or from God. Humanity has responsibility to nature and to God and is dependent upon both. This is both an ecological reality and a theological insight.

GOD AND NATURE. God is active in the universe as creative persuasive love in the whole creation. God is responsive love experiencing the universe throughout its history.

CONFLICT, SUFFERING AND EVIL in nature and humanity are an inevitable consequence of free creatures sharing with God in their own creation. Alienation of man from God exists, of man from man and of man from nature. The overcoming of alienation is the drama of creation and redemption of which the present ecological crisis is one scene.

HOPE moves us on. The unity of God, humanity and nature affirmed by faith is the object of Christian hope. But the expression of this hope in history will be realized only if there are fundamental changes away from what is now valued and from what we are accustomed to. It calls for a new way of life based on a new ethic of ecological sustainability and social justice.

B. Vision and Praxis

It is perhaps the commonest of all charges against Christians that they do not "live up to their beliefs". Such criticisms are not made only by those outside the Christian community. Christians frequently level them against one another. Christian history affords numerous examples of situations where members of the same church, or even congregation, whose versions of the faith are virtually indistinguishable, have taken opposite sides on some moral issue. It is equally true that Christians of widely different theological persuasions have found themselves united on a question of public policy – and united indeed not only with fellow-Christians but with humanists and adherents of other faiths, all of whom would claim that they were acting in the light of their religious or para-religious beliefs. Or again, it is not unknown for Christians, under the pressure of newly and perhaps reluctantly formed moral convictions, to modify their theological understanding. To give but one example, this has certainly happened of recent years in the case of some Dutch Reformed theologians in South Africa.

What, then, given such apparently very fluid connections between them, can we usefully say in theory about the inter-relation of vision and praxis?

The first point to be noted is one that might be thought to make this somewhat chaotic-seeming situation more puzzling still. The picture of God to which a Christian gives allegiance can never, if it is at all faithful to the Christian tradition, be a morally neutral one, free from value-judgements whether explicit or implied. Christian faith is not belief in a purely metaphysical concept, a notion of a totally mysterious being existing in wholly transcendent isolation. It speaks of a God who is quite definitely related to the world, and related in ways that bear a positive moral stamp: a God of justice and holiness; a God of mercy, who gives his own Son to suffering and death for the sake of sinful humanity. It sees that Son in Jesus of Nazareth, who is presented in the records as, among other things, giving quite dramatic moral teaching and example, and whom the Christian is to own as Master and Lord.

Nevertheless, it cannot be said that straightforward imitation of God or Christ in practice controls the behaviour of Christians. Very few of them have, for example, modelled their attitudes to property on those of Jesus. There are good reasons for this. We do not have to think very hard to see that for all human beings to take Jesus' own life style or his injunctions to his disciples as binding on themselves, to forsake all, to sell all their possessions and give them to the poor, would be not just impracticable but nonsensical. Who

are the poor who are to receive these benefactions? Woe to those whom the Last Day catches holding the fatal wealth passed hectically from hand to hand! Such 'rules', such an example, cannot be universalized, nor can anyone as intelligent as Jesus have been unaware of that fact.

The need to escape from so simple-minded an approach became clear at an early stage. Already in the NT we find Christians, under the impact of Jesus' own ratification of the two great commandments of Judaism and his own sacrificial self-giving, settling on one master-concept to control Christian behaviour, that of love, *agape*. "Love works no ill to his neighbour, so love is the fulfilling of the Law" (Paul); "He who sees his brother in need and shuts up his compassion from him, how does the love of God dwell in him? " (John). What is more, the basis of such behaviour is found in the nature of God himself: "God commends his love towards us in that while we were yet sinners Christ died for us" (Paul); "God is love; and he who abides in love abides in God, and God in him" (John).

But this brings its own problems. The principle adopted is so broad that widely varying patterns of behaviour can be validated from it. To take one simple example: the canon of love was indeed applied in the NT to revolutionize the mutual behaviour of Christian masters and Christian slaves, but there is no hint that it might rule out the very notion of holding another human being as a piece of property. Eighteen centuries later Christians were still to be found taking opposite positions on that very question. To generalize: it is possible to argue that if love governs person-to-person relations, any social system can be a matrix for happiness and fulfilment, and that if it does not then no system will be so, and that therefore social change is irrelevant to the Kingdom of God. That argument can be shown to be inadequate, but not at a simple level.

The problem of relating vision to praxis, therefore, is a difficult one for a reason which may be summed up as follows: even if our vision of God and of his relations with the world has within it quite strong elements of value-judgement, these are likely to be of so general a kind that specific directions for praxis cannot be derived from them alone. In fact, changes in the moral norms we regard as desirable for the most part derive primarily from changes in the human situation and in human sensitivity to that situation. This is true of all human beings, not just of Christians. Why for instance are we in the 20th century exercised about human rights in a way which even the 16th was not? Not just because human rights are more savagely violated now than ever before. We may be able technically to oppress more people at once, and to perpetuate new crimes upon them, but the moral quality of our oppression is not noticeably worse. What has changed is that in a modern society we have become aware, as Karl Marx pointed out, that the well-being of the community rests far more on the contribution of every member of it, even the poorest and least educated. Moreover, economic power in the form of wealth is more widely distributed, and this partial increase in the wealth of the masses generates expectations for the individual which are reflected in the standing which the individual expects to be accorded. The theoretic concept of human rights as such is not new. The concept comes to have urgency and solid content, to be apprehended as real, because conditions have changed. Similarly, the idea of the rights of other creatures, and of the need to treat the earth with respect, is not new. It strikes home now because the numbers-consumption-pollution function in the evolution of life has suddenly become a threatening factor.

Given the necessarily generalized character of the moral implications of the theological vision, therefore, it is not surprising that norms for praxis change with the times, and that Christians are found espousing many of the same causes as their secular contemporaries, and justifying their interest on theological grounds. What the vision means for praxis can be discerned only when the situation that calls for a certain praxis either exists or can be seen to be about to exist. The prophets of Israel predicted what would happen if certain action was not taken in the existing situation. They did not concern themselves with trying to predict future situations and what people ought to do in those. Indeed, even if someone had the gift of doing that, his words would have no compelling relevance to the actual life of humanity.

But we can go even farther than that. What we see clearly now, perhaps for the first time, as a result of the ecological crisis, is that the need for new praxis itself modifies the vision which is to justify the praxis. At first sight this might well be thought to invalidate the claims made for the vision. If our vision of God changes with our circumstances in such a way as to undergird the measures we feel compelled to take to meet the new circumstances, does this not suggest that the vision is itself a purely relative phenomenon, not the reflection of any permanent reality but merely a story made up to motivate and reinforce necessary action? Perhaps one major significance of the ecological crisis for Christians is that a closer look at the reasons for change shows that this is an over-simplification, and gives us new insight into the inter-relation of vision and praxis. The crisis is itself in part the product of a technology which in its turn springs from new discoveries about the nature of the world, and enables yet more discoveries to be made. In other words, we are not dealing merely with an increase in the scale of an earlier situation. The intensity of our problem goes hand in hand with new insights into the nature of reality which in their turn call for new and deeper understandings of God. What is remarkable, and ground for faith and hope in the religious sense of those terms, is both that the new insights into the nature of reality do lead to a profounder and more satisfying total picture of God. And yet this picture is in a sense not new; in the tradition there are many elements which rise to the challenge of the hour, which suggest a praxis to deal with a situation which cannot possibly have been envisaged when it was first formulated. The new picture of God is consonant at a fundamental level with the old; the God whom the old picture conceived is not defeated by the new situation but has within himself resources, only dimly discerned before because circumstances had not opened our eyes to them, which we now understand for the first time. Indeed, the fact that we do now understand them for the first time is itself explained by our new vision. For now we begin to take seriously what the tradition had to say about our being embedded in the cosmos, our not being, as we fancied in overweening pride of intellect, transcendent and godlike intelligences. So it is not in the least surprising that we see more about the nature and relevance of God as our situation changes, something that a proper vision would lead us to expect; and this in turn confirms our faith in God as Lord of the history of creation, and the Giver of redeeming grace.

Nevertheless, we still have to tackle the problem of the gap between the vision of God with its generalized indications for praxis on the one hand, and the detailed policies that we need on the other. What we noted earlier about the history of the relation between theology and ethics, kerygma and didache, gives us no grounds for supposing that we are likely to be able to work out by verbal argument, so to speak, on paper, a programme for dealing with the ecological or any other crisis from the picture we can present of God, which is, after all, itself only an approximate description of our intuition of a mystery. The model we seek cannot be one resembling deductive argument. Let us suggest another, under two main heads.

First of all, what bridges the gap that logical argumentation cannot bridge is the creativity which we have learned to see throughout the cosmos and particularly in ourselves. The vision is taken in by human persons, both individually and working in community, and becomes in them, in the hiddenness of their spirit, a factor enabling their creativity to bring forth new, practical and detailed answers for meeting the new situation, answers which are appropriate to a world of which the God is the Father of Jesus Christ. What therefore is needed to foster the emergence of such answers is not a mere argument from one set of words to another, an argument which, as we have seen, is impracticable, but the formation of persons-in-community, by the tradition. This is achieved not only by reflection on God as disclosed more fully by the words of the tradition interacting with our new understanding of the reality of the cosmos but also by the images and rituals, brought to us in the tradition and modified by our new feeling for the cosmos. Where there is a match between all these modes of self-realization, there groups of human beings are formed who are conscious of new moral imperatives which they work out in new concrete ways to deal with their diverse particular situations.

In practice, however, especially in a matter like that of the ecological crisis where so much depends on securing policies which, even if not identical, are at least coherent and complementary on a worldwide scale, it is not enough that each individual or household, tribe or town, factory or farm, should do whatever it thinks best. Our second point, therefore, must deal with the fact that the very diversity which we have said must be expected is itself a defect and a problem; for clearly we have not yet gone far enough in seeking an effective inter-relation of vision and praxis.

It is not unreasonable *a priori* to assume that where the ultimate reality undergirding the universe has a coherent moral character, the practical policies that are truly sympathetic to that divine reality and cooperate with the loving wisdom by which it draws all things to their perfection will be themselves mutually coherent. If, then, we find that they are not, the reason is likely to be one or more of three things: either our vision of divine reality is blurred or distorted; or the vision has not yet been allowed to infuse us deeply enough with its own spirit; or we have not yet thought clearly enough about the implications of whatever action we have decided to take. The appropriate responses are not hard to specify in theory: profounder reflection on the vision; a more penetrating critique of the motives, individual or corporate, behind our particular policies; and more imaginative research into all the effects of those policies. But it is possible to do all these things, and still miss the mark. Why?

The great purpose of God in Christ, as we saw when discussing history, nature and grace, is the creation of persons-in-community, a community which is one of the world-wide family of man in fellowship with the creation. But if the goal is such a community, it cannot be approached by individualistic methods. The steps we have to take on the way towards it must themselves be taken in community. In community we must learn to understand and clarify the vision, and modify it, if need be with the help of those who are not of our mind; in community we must learn to face our own motives by submitting ourselves to the criticism of others whose natural self-interests are not our own; and in community we must learn the effects of our policies, chiefly from those who are affected by them. Nor can any of this be done effectually by theorists alone, working at second-hand. The ones who understand nature and nature's God most truly are those who have to live and work in community with nature, by sea or land or in industry. We shall never work together with God till we work together with each other. The only way to a harmony of truth and conduct, of vision and praxis, is the way into community with all creatures and all our fellow-humans; and it is this fact which authenticates that way as coming from God who is love.

Henry Moore, bronze on MIT campus.

VI. Recommendations:

Our discussions suggest to the World Council of Churches and its member churches these urgent actions:

1. The findings and papers of this Consultation should be made available as a study booklet to churches and groups, as well as other sub-units in the WCC with a request to promote discussion of the issues raised and to report reactions and comments.
2. An ecumenical study project should be organized on the development of an ethic of ecological sustainability and social justice including the following concerns as highlighted by this Consultation:
   a) Humanity's place in creation and the relation between the instrumental and intrinsic value of creatures.
   b) The nature of God's creativity and its relevance to human creativity in science and technology.
   c) The evaluation and critique of particular social and economic systems in terms of their assumptions about ecological sustainability and resource use.
   d) The conflict between the demand for ecological sustainability and the demand for economic justice and how to evaluate priorities.
   e) The evaluation of modern technology in relation to serious ecological hazards, dangers for workers and others, and undue cruelty to animals.
   f) Examination and evaluation of local, regional and national action experiments, by Christian groups and others, with new life styles directed towards ecological sustainability, with a view to formulating the constituents of an ecumenical ethic and life style.

It is urged that the ethics of ecological sustainability and social justice be included as one of the central themes of the 1979 World Conference on the Contribution of Faith, Science and Technology to the Just and Sustainable Society. The recommendation is that there be a consultation on this theme in preparation for the 1979 Conference.

3. There should be ecumenical consideration of the question: "Should science be restrained? By whom? And how?" This issue reflects discussions during this Consultation of the need for greater knowledge of the way in which decisions concerning scientific research and technological innovation are made and the desirability of more effective methods of social control.

This suggestion is forwarded to the Working Committee on Church and Society for its consideration.

BIBLICAL VIEWS OF NATURE

John Austin Baker

One or two remarks by way of preamble may be helpful in preventing misunderstandings. This paper is descriptive and interpretative; it is an attempt to convey my understanding of the views of nature found in the biblical writers. It is not intended to draw normative conclusions for our own attitude to nature or our treatment of it. It is, therefore, primarily a religio-historical essay, not one in "biblical theology". The most I have allowed myself by way of contemporary application is to comment at various points on which of our current attitudes and policies seem compatible with the biblical view under consideration, and which do not. Secondly, I have called the paper "Biblical Views of Nature", because I do not believe there is any one view held by the whole range of biblical writers. Any single view which incorporated all their various insights, assuming such a synthesis could be made, would be a theological construct of our day, not something properly called "biblical". This is not to say, of course, that there are not themes and beliefs which the biblical writers share in their approach to nature; but the differences are as important as the common assumptions. Again, however, I have allowed myself to draw attention to some of these common (or majority) assumptions, since these can be helpful in any attempt to compare biblical views with those from other sources.

The writers of the Old Testament unlike ourselves, did not have an immense stock of universal or semi-abstract terms. While this limited them in some directions – philosophy and metaphysics, for example – it also saved them from a certain woolliness of thought to which we are peculiarly liable. Thus, the lack of a word corresponding to our term "nature" was in some respects a handicap; but it also safeguarded them against lumping together things that have no obvious business together, and against being taken in by such phrases as "communing with nature", or "nature, red in tooth and claw". What they saw when they looked around them was not some undifferentiated global category but particular things – mountains, seas, rivers, crawling animals, oak-trees, birds, the sun and moon, and so on. Their nearest approach to an all-embracing word for their environment was, *eres*, the earth. The title, "Friends of the Earth", they might have understood; "nature-lover" would have required some explanation.

How far is man involved in nature, and how far has he distanced himself from it? The basic elements of this question can be found scattered about the OT. Man is part of the panorama of nature. Psalm 104 places him with great artistry in the context of all the other teeming life of the earth. If he is the final figure to be painted in, and therefore in some sense special or climactic, this is very much understated (v. 23). In the same way, in the older creation story (J) in Genesis 2.4b-25, both man and the animals are formed out of the soil (vv. 7,19). Here, in a strange fashion, the original fusion of supposed fact and faith-image, after an interim period of being dismissed by the religious mind as purely symbolic and crudely so, becomes in our day once again the vivid symbol for a faith-interpretation of literal fact. The OT does not go as far as the following quotation, but the germ of the idea is there:

"My body was originally formed from an ovum and a sperm in my mother's body, and this ovum and sperm were formed of matter which came into the bloodstream of my father and mother from the world outside. I am formed of the matter of the universe and am linked through it to the remotest stars in time and space. My body has passed through all the stages of evolution through which matter has passed over millions of years. I have been present when matter was first formed into atoms and molecules, when the living cell appeared. I have passed through every stage from protoplasm to fish and animal and man. If I could know myself, I would know matter and life, animal and man, since all are contained within me". (Bede Griffiths, *Return to the Centre,* 1976, p. 35).

Nevertheless, even this older creation story is concerned predominantly to stress the distinctness of man from the rest of creation. Birds and beasts may share a material origin with man, and even a divine artificer, but they are not adequate companions and partners for him (v. 20). Only another human being, formed out of his own living substance, can be that (vv. 21-3). It is this unique kinship, so the story claims, which explains the all-surpassing force of the bond between man and woman (v. 24). The superiority of man to the animals is further emphasized by the incident of man's naming of all the living creatures. This act has two important implications. First, to give a name to some other being is to claim and exercise sovereignty over it. So a parent names his newborn child, an overlord his vassal (2 Kgs 24.17). True, man gives a name to his wife at her first creation (Gen. 2.23), implying the male hegemony characteristic of the biblical world, and reasserts his authority over her, in accordance with God's judicial verdict after their joint offence, by giving her a new name (3.20). But the first of these two names, the generic, "woman" (*'iššā*), emphasizes that woman is the only creature who belongs in the same category as man (*'iš*). Secondly, there is the strong conviction of the whole ancient world that a true name expresses the nature and controls the destiny of its owner (cf. e.g., Genesis 35.16-18). By giving the animals the truly appropriate name for each (Gen. 2.19), Adam proves that he has insight into their true nature. This at once puts him on a different plane from them. He is a creature nearer to God than they, for he shares some at least of the insight which enable God to create them in the first place. So the giving of names to the animals by man is a sign of actual superiority and legitimate authority over them on his part – not the absolute superiority and authority that belong to God alone, but real nevertheless, even if relative. By this act of sovereignty, Adam proves that none of these other creatures is a "helper fit for him" (vv. 18,20); and paradoxically the act of naming by which he claims authority over his wife is also a recogni-

tion of her essential equality with him. That this is the correct reading of the story is confirmed by the divine sentence passed on Adam and Eve for their offence in eating of the fruit of the tree of the knowledge of good and evil. Because man has rebelled against his proper overlord, God, his own subjects are to rebel against him. The tillage of the earth was once within his strength and its fruits were all beneficial (2.15); now it is to yield less, and that only to unremitting labour, and some of its produce will be worthless for human consumption (3.17-19). Similarly, the woman who upset the order of things by persuading her husband to disobedience loses the relationship of a free if subordinate partner and becomes his servant, driven by a compulsive attachment (3.16). In all this, too, it is possible to discern the traits of kingship in the portrait of man, expressed not only through the naming ritual but also in the ancient cultic symbolism of the tending and watering of the tree of life, a sacral duty of the king.

In the later creation narrative (P) in Genesis 1.1-2.4a, man's supremacy is spelt out categorically, though here, be it noted, the sub-plot of male superiority to the female is eliminated. This is not to be taken as implying equality of the sexes in the writer's mind, merely that in the context of the relation of man to nature, all human beings share in the distinctive superiority of their species in the created order. In this story, man's supremacy is given technical theological expression, peculiar to this writer and his school. Man is "in (God's) image" and "after (his) likeness" (Gen. 1.26-27). The exact meaning of this phrase has been endlessly debated. There may be influence from the Egyptian formula, according to which the Pharaoh is the "image of Amun-Re", in which case there are viceregal overtones, made explicit in v. 28. But the Hebrew and Egyptian phrases are not truly parallel. Much more certain is the implication that man is the nearest visible pointer to what God looks like (cf. Ezk. 1.26). The interesting question is: how far is this similarity thought to go below the surface into the realm of understanding and character? To some degree it must do, since it is improbable that any writer would make God give even a shadow of his own unique likeness to a creature that had nothing in common with him; and this commonsense conclusion is confirmed by the fact that God entrusts to man dominion over his new and wonderful earth and its other inhabitants.

The major difference between this creation story and the older one, so far as our present subject is concerned, is that in Gen. 1 the theme of a common material origin for men and animals is suppressed altogether. The writer seems to have held a view, instanced elsewhere in the ancient world, that the earth and the sea themselves "brought forth" their various inhabitants (vv. 20-1,24-5), but he has combined this with safeguards against any divinization of earth or sea by insisting simultaneously that in fact God himself "created" (v. 21) and "made" (v. 25) the creatures which these primordial entities generated. The resultant picture is that all animal life was produced either by the earth or the sea, as a result of God's creative edict and operation. There is a very careful gradation upwards from the production of plant life (vv. 11-12), where God issues the creative fiat, "Let the earth put forth vegetation, etc.", but is not said to have "made" or "created" what is put forth. The writer seems to be saying that animal life, whether on land or in the sea, is more marvellous than mere plant life, and, although issuing from the womb of the earth and from the waters, required a special operation of God to bring it about. Then in the case of man we take yet another step upwards. Here the divine edict and activity are everything: no intermediate creative source is named. Man is presented as created by God directly, and the question whether he too came from the earth is at least passed over in silence. It is possible that Ps. 139.15 draws on a myth that man was "earth-born". If such a view was current, then the writer of Gen. 1 has deliberately snubbed it. As for the fact that God is said both to "create" (v. 27) and to "make" (v. 26) man, there do not to the present writer seem to be solid grounds for finding here two distinct theological concepts. As is well known, the verb *bara'*, "create", is found in the OT only with God as subject. The significance of this is hard to assess. The word is used only by the Priestly Writer, Deuteronomy, Jeremiah, Second and Third Isaiah, Amos, Psalms, Malachi and Koheleth. With the exception of Koheleth who is late, and therefore drawing on an already established usage, all these sources are strongly priestly in character (the Amos instance comes in a formal hymnic doxology which may or may not be the prophet's own work). Since the OT is, to all intents and purposes, the only Hebrew literature of its period that we possess, it is precarious to argue from its evidence that *bara'* was an exclusively theological *terminus technicus* with no secular use. Etymologically it has been linked with an ancient South Arabian verb meaning "to build", and with a verb in the dialect of Socotra meaning "to bear, bring forth". The absence of more standard ANE parallels suggests that it might have been a fairly esoteric word, entering Hebrew through a specialized channel of some antiquity. (There may just be some significance in the fact that "Levi", the priestly gentilic, is also, in one view, related to a South Arabian word for a cultic official). On balance, the most likely view would seem to be that *bara'* simply means "to build" or "construct", but that it came into Hebrew as part of the sacral vocabulary of priestly circles and may already at its importation have had by convention an exclusive link with the deity. What we are not justified in doing on the basis of known usage is to read into *bara'* anywhere in the OT later metaphysical understandings of the idea of creation, such as *creatio ex nihilo*, which is not the sense of Gen. 1.1f. and is indeed not found in Jewish religious writing until 2 Macc. 7.28, where there is undoubted hellenistic influence. In the end, therefore, there is no reason to see any substantial difference of meaning between "create" and "make" in Gen. 1. The collocation of the two words at the end of the Priestly creation story (Gen. 2.3) is a sonorous full close for stylistic effect. Nevertheless, with regard to our main point, it seems clear that by stressing the direct divine activity involved in the making of man, and by omitting any reference to physical stuff out of which man is formed, this writer is intentionally minimizing that which is common to man and the rest of the animal world. The only common bond is the theological one: that both are works of God and created to fulfil the particular purposes he has in mind for them.

It is clear, however, that man's purpose and role is a unique one. Man in Gen. 1 occupies much the same high place in the scheme of things as he does in Ps. 8: "Yet thou hast made him little less than God, and dost crown him with glory and honour. Thou hast given him dominion over the works of thy hands; thou has put all things under his feet, all sheep and oxen, and also the beasts of the field, the birds of the air, and the fish of the sea, whatever passes along the paths of the seas" (vv. 5-8). To our ears such words sound very like the most blatant human imperialism toward the rest of nature, as does the divine commission to man in Gen. 1.28; and in modern times they may have fostered such an attitude and been used as a divine "exploiters' charter" to justify it. But what in their biblical context did they originally imply?

One connection of this type of language is with the institution of kingship. Under the influence of Mesopotamian models, even quite petty kings in the ANE seem to have used

cosmic iconography to express their status and authority. Solomon's lion throne, with six steps and a curved back (1 Kgs 10.18-20), symbolized universal dominion; and the embroidery on the collar of the later high priests, which was probably zodiacal and signified the whole cosmos, was almost certainly taken over from the royal robes of earlier times (cf. Sap. Sol. 18.24a). "Kingship came down from heaven", the ANE believed; and part of the mystique of kingship was that every king was God's vicegerent on earth. One of a king's most important duties was to ensure fertility and prosperity by his obedience to the gods and by his observance of the yearly rituals. We can trace thinking of this kind at many points in the OT, for example, in the famine sent on Israel for the wickedness of Ahab (1 Kgs 17.1); or conversely, in a text like Ps. 72, where unimaginable abundance is to be a mark of the reign of the ideal ruler. The conditions pictured in this psalm – for example, the king's worldwide sovereignty (v. 8) – certainly never obtained in any actual reign; but the psalm is nonetheless not just a dream of an indefinite future. V.1 refers to an actual king; it is a prayer, perhaps used at the coronation, that the vision painted in the psalm may come true in *this* king's reign. Primarily, therefore, the "man" and "son of man" of Ps. 8 is also the king, whose sacred office endows him with the resources of divine power not just over his human subjects but over all other creatures within his domain; and it is only his sins which cause this power to be withheld. Later this correlation between righteousness and prosperity was to be democratized, and the magical element confined to the direct action of God; in the final versions of Deuteronomy, for example, the responsibility for righteousness is laid on all Israelites equally, and abundance is God's reward for this. But there is also another line of development, which continues to use the figure of the individual ruler. As hopes set on actual rulers are falsified, so the longing grows more intense for a ruler who will measure up to God's standards. Under such a king all the anomalies of man and nature will be ironed out, and harmony and abundance will reign. The most famous OT instance of this hope is Is. 11.1-9.

By a common feature of human mythical thinking, however, paradise in the end-time is thought of as the recreation of a primeval paradise at the dawn of creation, the lost "golden age". Thus we find a small but significant detail common to both Gen. 1 and the eschatological vision of Isa. 11: the vegetarianism of the creation. Animals eat grass, man eats grains and fruits (cf. Gen. 1.29-30 and Is. 11.6-7). It is not possible to decide for certain whether the prophetic vision of the end-time is consciously drawing upon paradisal traditions of the *Urzeit*, or whether a passage like Gen. 1 owes something to the prophetic imagery. Both no doubt derive along their respective routes from a long, complex and interwoven tradition history. (Awareness of a link between the eschatological fulfilment and the primal paradise story shows in the words, "and the snake (shall eat) dust", in all probability a gloss, added to Is. 65.25, which is itself a reapplication of Is. 11.6f.). What we can say is that the basic assumptions of the Israelite view of history work out in two very different shapings of the whole historical sequence in the priestly and prophetic perspectives. Both are acutely aware of human sin and the disruption which it has imported into the whole created order. The prophet, however, is interested primarily in the resolution of this discord in the new age which God is going to inaugurate, the world in which righteousness is going to be achieved and peace and wellbeing reign. The priest sees God's goal as something much more immediately manageable, namely a world where life is regulated by the God-given law, and any margin of failure is covered by cultic atonement; consequently, though recognising the imperfections of the present he does not look for any radical reformation of it. The time – which must be a reality at some point – when God's ideals are fully realised is in the primal past. Then all things were "good, very good" (Gen. 1.31). The future which the prophetic vision desiderates and the past which the priestly theodicy presupposes are, therefore, inevitably very close to one another in character; both speak of a way the world ought to be, but is not. And both link this ideal condition with the right exercise of kingship, either that of the perfect Israelite ruler or of the human species in its cosmic vocation. But the "dominion" which is promised to man in Gen. 1 or Ps. 8, and the government expected of the ideal Davidic ruler in Isa. 11, are poles apart from the kind of right to egotistical exploitation which the words superficially suggest to our ears. They are in essence a perfect obedience to the will of God which respects the divine order in nature and is rewarded by nature's recognition of man as the greatest of God's creatures and its provision of a sufficiency of food for all flesh (cf. Ps. 145.15f.). If this vision has anything to say to our present situation, it is certainly not to ratify the extermination of species or the ruthless greed which exhausts precious natural resources for short-term profit. On the other hand, it would be over-simple to claim the OT in support of our modern study of animal life or the work of environmental conservation, since it is clear that neither priest not prophet thought the order of nature as we now see it to reflect God's intentions, either original or ultimate, for it.

We referred just now to the general Israelite assumption that human sin was the factor that had disrupted the cosmic order. The Torah expresses in a number of ways the idea that man declined drastically from the standards of the golden age. The story of Cain and Abel (Gen. 4) is one; the decline in the normal length of human life, another (cf. Gen. 5 with 10.10-26 and 47.9). (This latter feature is another link with the late prophetic vision of restoration in Isa. 65.17-25, already mentioned, where some improvement in longevity to a norm of 100 years is promised: v. 20). Another mark of decline, of more direct relevance to our present subject, is the change in the divine laws of life after the flood. The new start for the human race, embodied in Noah and his family, is marked by a divine covenant, modelled ultimately on the treaties imposed unilaterally in some ANE empires by suzerains on their vassals, and consisting of promises by the overlord and obligations laid upon his subjects. The promise is that never again will God destroy all living things by a flood (Gen. 9.8-17; the older version of the story has the same promise, though not in covenant form: 8.21-2). It is interesting and important that this covenant is made not just with man but also with all living creatures (five times repeated: 9.10, 12, 15, 16, 17) and indeed with the earth itself (9.13). The new laws of life (9.1-7) replace the ordinances established at the creation, and modify them in significant respects. No longer is man's food to be fruit and grain only: "Every moving thing that lives shall be food for you; and as I gave you the green plants, I give you everything" (9.3). (This licence is qualified for Israel later, when they are granted the higher insight, denied to the nations, of the distinction between "clean" and "unclean" animals. Christianity's rejection of this distinction is thus of great symbolic importance for her universal mission.) The flood and the subsequent new start for the world are thus used as an opportunity to switch from the theoretic "golden age" to the conditions actually obtaining; and one of the saddest features of this change is the degradation of relations between man and the animals from their first created beauty. The language of Gen. 9. 1-2, when compared with the phrasing of 1.28f., betrays at once the poignancy of the writer's feelings: "The fear of you and the dread of you shall be upon every beast of the earth, and upon every bird

of the air, upon everything that creeps on the ground and all the fish of the sea; into your hand they are delivered." The language is that normally used of a conqueror slaughtering a routed army or sacking a fallen city. Man has become the enemy of all living things.

The OT, then, does nothing to justify the charge that it blesses an exploitative, humanly self-centred attitude to nature. It recognizes man's preying on nature as a fact; but it characterizes that fact as a mark of man's decline from the first perfect intentions of God for him, or as a defect to be eradicated in God's perfect future. This is in tune with another notable feature of the OT, namely that it is permeated with what we can only call an affectionate and admiring approach to nature. We have already noted the supreme example of this in Ps. 104; but instances of it are to be found in other psalms which are not, as is that one, modelled on already existing foreign poetry (cf., e.g., 19.1-6; 65.0-13; 84.3; 136; 148). The same attitude is particularly evident in the wisdom literature, with its many similes from observation of animals, weather, plant life, and so on. We also find a kindred spirit in some of the prophets, where the faithful obedience of non-human creatures to the divine will is contrasted with the faithlessness and perversity of men: "Even the stork in the heavens knows her times; and the turtledove, swallow and crane keep the time of their coming; but my people know not the ordinance of the Lord" (Jer. 8.7). This admiration of nature finds its climax in the book of Job, where the wonders of the natural order are used for a didactic purpose unique in the Bible, and possibly in all ancient literature: to make the point that man's whole attitude to the created order is wrong, because it is totally egoistic, totally anthropocentric. If man were to stop even for a moment to consider the universe as it actually is, he would see that by far the greater part of it has no relevance to him at all. If God created Behemoth and Leviathan, it assuredly was not for man's benefit (chs. 40-41); it must have been for some purpose opaque to man, who can think only in terms of himself and his situation. Such creatures glorify God in their existence according to rules far beyond our ken; he made them and delights in them for their own sake, not for some ulterior usefulness to us as human beings. The same point is made in a rather different way by drawing Job's attention to the seemingly idiotic behaviour of certain animals such as the ostrich (39.13-18) or to the apparent pointlessness of certain phenomena, such as the brief spring rains which cause a short-lived carpet of tiny flowers to appear in the desert (38.26-7). Why have flowers where there is no one to admire them? Man did not arrange any of these things; and if it had been left to him, he never would have done! But God did arrange them. We are left to draw our own conclusions: either that God is daft, or perhaps that we with our purely human-conditioned "wisdom" take far too narrow and short-sighted a view ever to reach any genuine understanding of reality.

This is not to say that a sound and sensible way of dealing with nature is not a part of the wisdom appropriate to man, and as such itself a gift of God (cf. Isa. 28.23-9). Not only is this accepted; it is in fact one particular application of a more general principle developed in the OT, which is of some importance for our subject. This is the principle that by observing the way in which nature functions we can arrive at *moral* guidance for human life. In the OT this is not taken beyond the most obvious instances; for example, the world is made in such a way that the lazy are likely to starve, and therefore it is wrong to be lazy. But significantly, such conduct is held to be wrong not just in a pragmatic sense but also in a theological one. For, as with everything else in the OT, such thinking has an extra dimension, the omnirelevant fact of God. Since it was the wisdom of God which made the world, he must have had some purpose in every detail of its ordering, and he must therefore have intended laziness to be dangerous. Hence diligent and sensible work can be said to be something which God himself both commands and commends, and sloth something he condemns. There are, then, in the OT elements to justify a pragmatic, science-based ethic, at least in some such general terms as these: that what by observation we discover really to work best, both for man and for other creatures, is something which loyalty to God requires us to put into practice. Even the point about what is best for other creatures, which may seem very modern, is not without OT foundation of a kind in such passages as the law against taking the hen-bird as well as the eggs from the nest (Deut. 22.6), or this saying from Proverbs: "A righteous man has regard for the life of his beast" (12.10) – where, be it noted, the quality that makes a man considerate of his working animals is not prudence or good business sense but "righteousness", a point which is all the more significant when we remember that in the OT one of the marks of righteousness is not mere even-handedness but active favour to the weak and deprived.

One reason why the OT attitude to nature is more sympathetic and comprehensible to us than that of some other ancient people is that for a good many of the OT writers, though not all, nature had been, to use a modern term, subtantially "demythologized". An example may clarify the point. In the Ugaritic texts of the mid-second millennium occurs the following passage: "If thou smite Lotan, the serpent slant, Destroy the serpent tortuous, Shalyat of the seven heads..." The name Lotan is the Canaanite equivalent of one which appears many centuries later in the OT, and to which we have already referred, namely Leviathan, who is also a sea-monster. In the OT, Leviathan plays a number of roles. In Ps. 74, he is, as in Ugarit, many-headed, and also an enemy of God. (By the process known as "historicization" his destruction is linked with the Israelites' crossing of the Red Sea at their Exodus from Egypt. A similar association of the killing of the sea-monster with the Exodus occurs in Is. 51.9-10, but here the monster's name is "Rahab", a mocking name in the Isaiah tradition for Egypt, cf. Is. 30.7). In Isa. 27.1 we have mention of "Leviathan the fleeing serpent, Leviathan the twisting serpent", another very close parallel to the Ugaritic text, but here the monster symbolizes cosmic evil, to be overthrown by God at the eschaton. In striking contrast to both these uses of the Leviathan figure, however, are Ps. 104 and Job 41. In Ps. 104 Leviathan is a pet with whom God enjoys playing in his leisure moments (v. 26); and in Job he is the greatest of all God's creatures, "king over all the sons of pride", and is cited simply to crush the anthropocentric conceit of Job. If we try to date these passages, we find no steady theological trend. A majority vote of scholarly opinion would probably give the sequence: Ps. 104 - Ps. 74 - Is. 51 - Job 41 - Is. 27. In other words, running side by side we have the sea as something evil and something good, and the monster as a supernatural evil being, a symbol of anti-God forces, and a magnificent testimony to God's wisdom and power.

The theological background to this ongoing activity of "demythologizing" which developed in certain quarters in Israel may be analysed very crudely and briefly as follows. The basic premiss of Israel's faith is that her God is stronger than anything or anyone; and for this to be so, she found, it was necessary for God to be radically distanced from natural phenomena. Other nations in the ANE had advanced, it is true, well beyond the stage of a simple-minded identification of gods with natural forces or objects. But they were trapped in the morass of polytheism; and one of the reasons for this was that the traditional associations of various deities with particular phenomena – the sun, the moon,

the stars, storms, vegetation, the sea, and so on – meant that the obvious multiplicity of nature kept getting in the way of their struggles to apprehend the unity of the divine. By a kind of inspired bigotry, the Jews, however, succeeded where others failed. By holding fast, in the teeth of all those disasters such as exile and persecution which seemed to prove the contrary, to the thesis that their God was supreme, they found themselves forced to treat everything – nature, humanity and history – as subordinate to him, indeed as his instruments, even when the uses to which he put them proved morally inscrutable. This has two very important consequences for the OT attitude to nature. First, nature is progressively depersonalized and demythologized: "who makest the winds thy messengers, fire and flame thy ministers" (Ps. 104.4). It is no longer the manifestation of supernatural beings but now for the first time actually merits the name "nature", though, as we have said, the Hebrew language did not have that concept at its disposal. The climax of this process in the OT is the book of Ecclesiastes (Koheleth), which our own outlook on the world finds remarkably sympathetic. Secondly, following on from this, man loses his numinous dread of nature. Nature can still frighten men, but only by virtue of being stronger than they in a natural way, from which they may need God to rescue them, but which they recognize as being in principle a strength they can understand, and in many cases do something about.

We may summarize the main points emerging from the OT utterances about nature as follows: (a) For the OT writers, the determining factors in thinking about nature, as about every other subject, are the all-controlling rights and power of God. "The earth is the Lord's and the fullness thereof" (Ps. 24.1); and this can be carried so far even as to have practical consequences for human social organization, as in the principles underlying the law of Jubilee, that no human being can ever "own" land outright but must be regarded as a tenant installed by God (Lev. 25.1-34).

(b) Under this overall sovereignty of God, man does have a position of control over nature, which is approved by God, and which is meant to be exercised in a spirit of respect and responsibility. Skills and technology of all kinds may be admirable, but the tyrannical or greedy use of human power over nature is a failure deriving from human sin, not from God's intention in creation.

(c) Man's proper control over nature is made possible because the realization that God is One and Supreme, and therefore transcendent, effectively desupernaturalizes the world, ridding it of superhuman personal power, whether divine or demonic, and placing man in a position to use his powers rationally in dealing with nature.

(d) Nevertheless, nature is not to be evaluated simply in terms of human needs and interests; and to think that it is, is simply a mark of folly. God created the greater part of the world for its own sake – a point that comes home even more strongly to us, with our knowledge of the immensity of the universe, – and wisdom consists fundamentally in recognizing this and the limitations which it imposes upon us. Technology may explore and exploit nature, but it will never discover the way to "wisdom" (Job 28). The truly wise man never imagines that he knows fully what God was about in creation.

(e) Since God, however, has a moral and rational character, man must in the end submit to things as they are, as a genuine revelation, so far as he can grasp it, of ultimate goodness and wisdom. Hence the careful and comprehensive observation of nature will yield indications for human behaviour which were part of God's intention in creating in the first place, and which therefore have the status of moral imperatives for man. We must ultimately be guided by respect for the intricate character and needs of the natural order.

(f) If we are so guided, then we may hope even to improve the condition of nature, which does not as yet embody God's character as human beings have come to know this through their communion with him. Nature is not perfect; there is a work of salvation to be done in it, as well as in humanity, as part of God's eschatological purpose, and this salvation is part of man's responsibility for nature.

In contrast with the OT, the *New Testament* has relatively little to say about nature. The reasons for this are some fortuitous, some sociological, but some are inherent in the nature of the primitive Christian community and its world-view. The fortuitous reasons arise purely from the scale and character of the NT material. To start with, the volume of the NT is only 30% of that of the Old. The bulk of its contents falls within a period of forty years, and the outside limits of its dating bracket only a century, compared with the nine centuries between the earliest and latest passages in the OT. The NT is the work of a relatively small community with highly selective interests, whereas the OT is the product of a whole nation, a minor one certainly, but always much larger than the Church in the NT period, and inevitably concerned with a nation's wider issues and situations. Hence it is no surprise to find in the OT far greater diversity of literature than in the NT. There is nothing in the NT, for example, to parallel the large collections of "observations on life and world-order" which we call the wisdom literature of the OT, or its extensive range of liturgical poetry, or the detailed corpus of its laws on what we would regard as secular matters. The very types of material, therefore, in which an attitude to nature might be most likely to be reflected are precisely those which are missing from the NT.

Sociologically, it is hard to escape the impression that most of the NT writers are "urbanized", compared with the predominantly agricultural orientation of the mind of the OT. The Gospel material, especially in the teaching of Jesus, with its use of images from nature and husbandry, is nearest to rural society and to the world of the OT; James is thought by some scholars to be addressed to the Palestinian Church. But otherwise there is little sign in the writers of any attention to nature; and their audiences, where known, are almost exclusively urban. While it is true that this would not have been as strong a distinction in the Roman world as it is in our own megalopolitan culture, nevertheless it is probably fair to say that nature was not one of the things in the centre of the mental focus of the early Christians; and this is partly related to their sociological classification.

There were, however, other reasons, inherent in the earliest Church and its Gospel, which conspired to minimize concern with the question of human attitudes to nature. The first was the approach of primitive Christianity to scripture. For Christians of the first century, the OT was their Bible, and it alone was the inspired Word of God. It might be thought that this would have awakened some interest at least in all the various subjects with which the OT deals; but one overriding factor prevented this. The first Christians were interested in the OT primarily as a vast source-book of predictions, some clear, some enigmatic, of the coming of Christ, his nature, life, death, resurrection, redeeming work, and heavenly glory, and of the mission and destiny of the Church. The literal sense of any passage was, in most cases, of much less importance than its prophetic meaning, which had to be disentangled by allegorical or typological exegesis. Nor were they interested on the whole in the total range of an argument or the total message of a book. These are

characteristically modern ways of using scripture. For them, any verse, sentence or phrase could be taken, out of context if need be, and its reference to Christ extracted by what seems to us at times over-ingenious exposition, but which, given the thought-forms of the day, simply sprang naturally from their exuberant and untiring obsession with the Gospel. Given this situation, it can be seen that many of those elements in Judaism which we have been considering were effectively blanked off from early Christian consciousness.

Secondly, there is the fact that the Christian message was initially a gospel of personal salvation. It impinged on ordinary life only at the points of religious belief and personal morality. The criticism of much present-day Christian preaching as being too much concerned with these two things instead of having something to say on corporate or global issues, must, if it is to be both honest and helpful, face the fact that in the foundation (and still authoritative) documents of the Church precisely these were the overwhelmingly dominant concerns. Christianity was from the start a religion of individual faith and morals, its corporate consciousness related not to membership of mankind but to membership of the elect community drawn out from the human race by its response to the Gospel. The question whether anything which is specifically Christian, yet of wider import, can develop from this basic character is, of course, a general concern of the Church today of which this Consultation is one small symptom. But it was not ever thus. The members of the church at Corinth received much instruction from St Paul, but none of it was directed at the matters we are considering. Indeed, when the Apostle does happen to mention a relevant OT text – "You shall not muzzle an ox when it treads out the grain" (Deut. 25.4) – he does so simply to apply it by a kind of allegorical interpretation to the economic support of those who preach the Gospel. No doubt St Paul was not anti-oxen, but he is quite clear that God would not waste valuable inspired wordage on such a subject: "Is it for oxen that God is concerned? Does he not speak entirely for our sake?" (1 Cor. 9.10).

The third and perhaps most important of all reasons is, of course, that the earliest Christians felt themselves to be those "upon whom the end of the ages has come" (1 Cor. 10.11). The "form of this world" was passing away, the new age was about to dawn; and it was a serious question what would happen to the bodies of those who had not yet died when the Last Day came, and so could hardly be resurrected (1 Cor. 15.51). Since, therefore, the created order did not have long to run, there was no incentive to develop a constructive long-term attitude to nature as it was. It is to their successors of the second generation that we have to look for most of the modest amount the NT Church has to say on this issue.

Turning now to this positive side, we note first that the underlying tonality, so to speak, of the NT is the same as that of the Old, namely that the created order is God's work and as such is good. In the Gospels, God's providential care extends even to the most insignificant animals, and the beauty of the wild flowers springing up in the fields of Galilee is greater than that of Solomon in all his glory (Mt. 6.26 = Lk. 12.24; Mt. 10.29 = Lk. 12.6; Mt. 6.28f.). There is no food which is unclean; impurity is a moral quality (Mk. 7.19). In his parables, Jesus assumes care and concern for animals, even if only in illustration of his main point (cf. Lk. 13.15; 15.4; Mt. 12.11 = Lk. 14.5). In St Paul, the wonders of the creation are sufficient in themselves to lead the open and rational mind to God (Rom. 1.20). He accepts, despite his rigorous Jewish upbringing, the liberating insight of Jesus that nothing is in itself unclean (Rom. 14.14; cf. Acts 10.9-16, 28; 11.5-10); and in discussing the question of meat offered to idols, while respecting the tender consciences of the more scrupulous brethren, he makes it clear that for himself, with his robust Jewish monotheism reinforced by the revelation of God in Christ (1 Cor. 8.4-6), there can be no problem, for "the earth is the Lord's, and everything in it" (1 Cor. 10.26-28). This fundamentally affirmative and confident attitude to the creation is reinforced by the doctrine of *creatio ex nihilo* (Heb. 11.3) which, as we noted, was not available to the OT writers, emerging as it does in the intertestamental period. In the Acts of the Apostles, we find the classic position again clearly stated: "...the living God... made heaven and earth and sea and everything in them. In past ages he allowed all nations to go their own way; and yet he has not left you without some clue to his nature, in the kindness he shows: he sends you rain from heaven and crops in their seasons, and gives you food and good cheer in plenty" (14.15-17). In the same work there are signs of a very positive theology of the natural order developing with the assimilation of the Middle Platonist thought of hellenistic Judaism: God the Unknowable, who created the world and everything in it, is not far from each one of us, for in him we live and move, in him we exist, indeed, "We are his offspring" (17.23-4, 27-8).

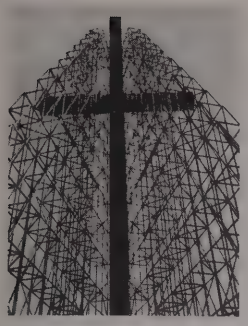
Nevertheless, even though the basic tonality, to pursue our metaphor, is that of the major key, it is shadowed from time to time by more sombre material in the minor. This is a reflection of the pessimism and anxiety afflicting the Mediterranean world around the turn of the eras. In Judaism, it found expression in that apocalyptic despair which in certain circles regarded the whole of the present created order as beyond redemption, and looked for a cataclysmic irruption of God to establish a new order from which evil would be banished. The wide dissemination in the Near and Middle East at this time of dualistic faiths, the staple of that religious phenomenon loosely labelled "Gnosticism", was another manifestation of the same malaise; while in Hellenism many suffered from a "sense of helplessness in the hands of fate" which made them "wonder whether it is possible to be at home in the world at all". Because the world had become "a hostile, alien place", they turned to astral cults. "The lower world was not centred in itself, but was under the control of the stars... Hence, in the last resort all activity here is trivial and meaningless, and if it seems to be independent, that is mere illusion" (R. Bultmann, *Primitive Christianity*, ch. 2).

These contemporary trends are reflected in the NT, partly in vigorous reaction against such beliefs, not by denying the reality to which they referred, but by claiming that in the Gospel men were delivered from helpless subjection to that reality. Thus, in such passages as Gal. 4.3, Col. 2.8, 15 and Eph. 6.12, the Christian is exhorted to enter into the freedom Christ has won for him, and to fight against the domination of the hypercosmic powers. Again, in Rom. 8.9-22, Paul seems to echo the Stoic views of the ageing of the world, as well as the Jewish apocalyptic conception of its subjugation by evil powers responsible for human sin and the disruption of nature. But he puts all this in a new theological perspective. The passage presents notorious difficulties of translation, but certain convictions of Paul stand out. If God was ultimately responsible for the universe's state of frustration, nevertheless this was always imposed within a context of hope: "the universe is itself to be freed from the shackles of mortality, and enter upon the liberty and splendour of the children of God" – in other words, the kind of transfigured, eternal existence promised to humanity in the resurrection of Jesus is to have its counterpart in the transformation of the cosmos. The groans of the universe, then, are not the expression of hopeless anguish;

they correspond to the cries of a mother in childbirth, they are the pangs of bringing forth a new order. It is true that the general diagnosis of the cosmic situation is not very different from that made by many other sects and schools of thought at the time. The Pauline tradition does not say, "This is rubbish! All this talk of deep-seated corruption and bondage to Fate throughout the created order is nonsense". On the contrary it is taken very seriously; all that Christianity claims is that it has a better answer to the crisis. But that answer is not a programme for redeeming the world of nature as well as the soul of man, so that they can then live in harmony to create the Kingdom of God on earth as it is, but a spiritual liberation of those men and women who believe in Jesus as the prerequisite of a total remaking of the cosmos by God's Spirit and in God's own time. The book of Revelation, with its vision of a new heaven and a new earth (21.1), is the logical culmination of this approach.

As time went on, a more optimistic note became discernible, chiefly in opposition to the false asceticism characteristic of the dualistic sects. Thus 1 Tim. 4.3-4 commends the right use of God's gifts in the order of creation. And there was one theological concept in particular in the later NT writings which offered a theoretical foundation for a more affirmative attitude to nature. This was the idea of the "cosmic Christ". In various forms the conception was developed that the pre-existent divine Christ was himself the divine agent in creation, and that the existence of all things was upheld by him. We find this in such diverse writings as Hebrews (1.3) and Colossians (1.16f.), but the best-known instance is the Prologue to the Gospel of John (1.1-4). The implications of this idea for a theology of nature are not, of course, worked out in the NT itself; but, obscure as the thought-forms undoubtedly are to us, there does shine through them a conviction that the whole universe, could we but see it, is in its essential nature in harmony not merely with some unknown divine power but specifically with God as revealed in Jesus, and that therefore there must be some *modus vivendi* between man and nature which, even if not yet attained, is in keeping with all that is best in both.

In seeking for any kind of theology of man and nature, the Christian cannot but be grateful that his Bible does not consist merely of the NT. Even the final point, that of the "cosmic Christ", would be virtually unusable were it not built on the world-affirming monotheism of the OT. But in conclusion can we see in the Bible as a whole insights which are not present in either Testament by itself? What cannot be ignored is the unresolved tension between the theological view which puts all the weight on God's wisdom in creation and the excellence of the cosmos thus created, on the one hand, and the theology which thinks eschatologically and looks to God primarily to redeem the cosmic order, on the other. The "cosmic Christ" concept can be used with either emphasis. Theilhard de Chardin employed a version of it eschatologically: in Christ is revealed "le Dieu d'en-avant", the *telos* appropriate to an evolving creation which in humanity has at last attained the self-determining freedom of reflective beings. What the OT and the NT together seem to say is that, on their understanding of God, the character of the primordial and the eschatological must be the same; there must always have been in God from the beginning that which is needed for him to be the Saviour in the end. Creation and Redemption are two expressions of the same Ultimate Being, its power and wisdom and love, even though the "mystery" of this Being was for long ages hidden and has been definitively revealed only in Christ and in the developing understanding of existence of which he is the source. The diptych of the creation story in Gen. 1 and the Isaianic vision of a new and perfected cosmos finds a counterpart in the NT terminology applied to Christ: he is "the first and the last" (Rev. 1.18); he exists "before everything"; in him "everything was created", and "all things are held together in him" (Col. 1.16f.). But at the same time, "the whole universe has been created for him", and "through him God chose to reconcile the whole universe to himself (Col. 1.16, 20). He "is its origin", but also destined "to be in all things alone supreme" (Col. 1.18); he is the one who "himself receives the entire fulness of God" (Eph. 1.23), but who also descended to our world and ascended again "so that he might fill the universe" (Eph. 4.10). Underlying this kind of language is without doubt a view of *redemptio* as *redintegratio*, the recovery of an original perfection which has been lost; this is the synthesis which seeks to reconcile the incompatibles of the priestly theology, for which Eden is something lost, and the prophetic, for which it is something that has never been found. Our own greater knowledge of the history of the universe puts us firmly on the side of the prophetic. But theologically we may still find the instinct of the NT synthesis significant, that in God himself there is a fulness and perfection which is unchanging and outside space and time, and that it is this which makes him the proper *telos* for a creation in which the mystery of that fulness is unpacked only through the ages of the evolutionary process, a process which passes through a series of increasingly critical stages and is now precariously poised in a dependence on the rational response of free creatures. In so far as the crucial factor for the future of nature on this planet at the moment is humankind, the NT claim that the reconciliation of the universe is made possible through Christ has cashable meaning. In Jesus, as portrayed in the Gospels, we see certain basic attitudes which may seem overly simple but are in fact adequate foundations for an approach to nature. The first is a conviction that the natural order need not be written off as in bondage to evil – the apocalyptic view – but contains both clues to the nature of God himself (Mt. 5.45) and conditions within which we can learn to be authentic children of our Father in heaven. The second is his equal conviction that we never shall so learn without a repentance which, among other things, learns to trust the existence with which we have been endowed as the gift of one to whom we can say, Abba. These basic attitudes do not assume that nothing can be done to improve nature – no countryman would ever be so silly anyway; but equally they presuppose a readiness to learn from nature and to be content with the limitations which, even at maximum development, it still cannot but impose upon us. The tendency of human beings here as in so many other fields is to say not, "What can be done?" but, "What do I want?" and to seek to extort that from nature, whether it is feasible or not. Our responsibility toward nature cannot be fulfilled simply by developing our positive and creative skills; it also involves denying ourselves and taking up the cross daily. All we can do will not be enough of itself to turn earth into paradise; but that after all is something for which we have to wait upon him who is both Alpha and Omega. The new heaven and earth are not of a kind to be evolved on our drawing-boards; all we can hope for here are images and foreshadowings of them.



THE OLD TESTAMENT VIEW OF NATURE

Klaus Koch

There is no semantic equivalent in biblical Hebrew for the modern concept of nature nor for the ancient Greek concept of *physis*. Even the translators of the Septuagint, otherwise eager to introduce Greek conceptions into their rendition of originally Semitic texts, found no opportunity for using that term which was undoubtedly an important one in the minds of most of their readers. Only in the books of the Hellenistic diaspora, written originally in Greek, is the word *physis* to be found three times in the Wisdom of Solomon, and eight times in 3 Maccabaens. But the Hebrew parts of Old Testament literature give no hint of a homogeneous cosmic process which is steadily expanding and contracting. They do not know of a *physis* in which man and his society were incorporated from primeval time in the same way as were animals and plants, sky and earth, and perhaps even the gods. Gerhard von Rad in his *Theology of the Old Testament* has made this point very precisely:

> "... still it is of the utmost importance to bear firmly in mind that Israel knew neither our concept of 'nature' nor the Greek one of a 'cosmos'. For her the world was not a stable and harmoniously ordered organism, including equally every datum, organic and inorganic alike, and so much to be regarded as a whole that the question of its ultimate determining principle (ἀρχή) was legitimate." [Vol. I London, SCM Press 1975 (Study Edition)]

Therefore the title of my paper may sound somewhat curious. How can one speak about the Old Testament view of nature if there is neither a concept of nature nor anything like it in this part of Holy Scripture? My task, however, is not as paradoxical as the title seems to indicate. The Old Testament authors were searching for the very essence and destiny of their nation as well as of every individual member of it. In their opinion what man is and what Israel is to be can be understood only in light of the relation between men, societies and nations, on the one side, and the earth on the other. The connection between Israel and her promised land reflects the anthropological structure of all human beings. Adam – not a name, but a term for mankind – and Adama, the fertile soil, are indissolubly connected. Earth, especially the cultivated land, fills the place in the Hebrew mind which *physis* occupies in Greek thought. But earth is not an autonomous, all-inclusive entity. Earth, adama or aeretz depends on sky as sky depends on Yahweh.

If the correct order is maintained, then, according to Hosea 2,21f., the Lord "will answer for the heavens, and they will answer for the earth, and the earth will answer for the corn, the new wine, and the oil, and they will answer for Jezreel." If we translate "'anā", the decisive verb in this sentence by "to answer", we inevitably narrow the sense. The meaning of the Hebrew 'anā may be to respond in a discussion, but it may also refer to non-verbal reactions, to the providing of new impulses by one subject to another within a given relation. Hosea appears to be thinking of a coherent chain in which God is the initiator, but an initiator who acts in interdependence with earth, man and nation. It seems to me that nowhere does the Old Testament offer such a pregnant description of natural process as in this sentence of Hosea. If this is true, then no other entity in Old Testament language corresponds to our term nature better than Yahweh, the name of God himself! He is the beginning and end of that chain, which sustains the functions of elementary life.

God is nature – this seems very strange to every western theologian. Is such a conception not the sign of Pantheism? And Pantheism has been damned in our theological tradition since the earliest times of the Church. *Deus sive natura* – was it not Spinoza who wrote this and who as a result was rightly excommunicated by his Synagogue?

God including nature – if I derive this conception from the Old Testament texts, it may be more than surprising! The exegetical literature on the Old Testament usually gives a quite contrary interpretation. Many Old Testament scholars are deeply convinced that the unbridgable gap between God and creation – and that means also the gap between God and nature – is the very Kerygma of the Old Testament. Let us examine this conviction. Perhaps it is not Pantheism that is moving the minds of psalmists and prophets. But perhaps it is not Theism either in the sense of our western theology.

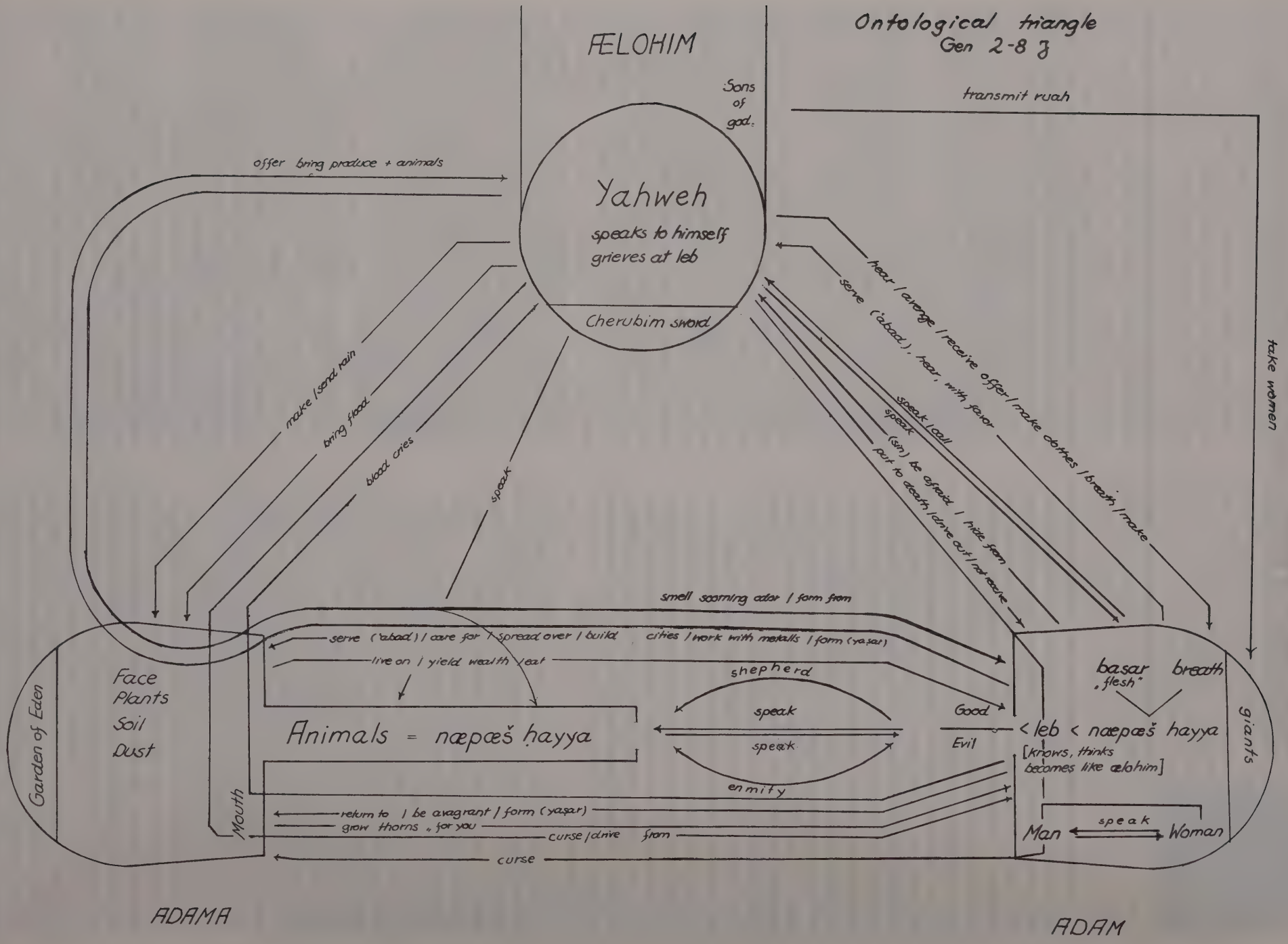
How are we to proceed? In order to challenge the commonly held presuppositions about the Old Testament view of man, God and nature, we must get to the very heart of Hebrew thinking and the Hebrew texts. Since it is impossible to go through the whole Old Testament canon and to deal with every relevant book, selection is necessary. I shall limit myself to: one chapter of the early literature, the Urgeschichte (pre-history) within the Yahwistic work; one chapter of exilic literature, the famous Genesis 1; and one chapter of late Old Testament literature, the predictions of the Apocalyptic books.

1. The Ontological Triangle in the J-Urgeschichte

In Old Testament writings creation is usually interpreted as the act of a transcendent God who by his word brings into being that which has no direct connection with himself. The image of God within creation is man. And while man is indeed connected with other creatures he has an immediate relationship to the creator, and to this extent is separate from all other animate or inanimate beings.

Let us support this statement by reference to the older of the two accounts of creation in Genesis, in the writing of the Yahwist. The growth and shaping of primeval man certainly stands in the centre of the story. Only man receives breath directly from God and is thereby entitled to establish dominion by giving names to the animals. I wonder, however, if this is not only one side of the coin.

I have tried to show by a sketch (see p. 48) how, in the primeval history of J, man's relation to God is connected in many ways with Adama, the earth, from which man is


Ontological triangle
Gen 2-8 3
ELOHIM
Sons of god:
Yahweh
speaks to himself
grieves at leb
Cherubim sword
transmit ruah
take women
offer bring produce + animals
make / send rain
bring flood
blood cries
speak
hear / avenge / receive offer / make clothes / breath / make
serve ('abad), fear, with favor
speak / call
speak
(sin) be afraid / hide from
put to death / drive out / not receive
smell soothing odor / form from
serve ('abad) / care for / spread over / build cities / work with metalls / form (yaṣar)
live on / yield wealth / eat
Face
Plants
Soil
Dust
Garden of Eden
Animals = næpæš ḥayya
shepherd
speak
speak
enmity
Good
Evil
basar breath
„flesh"
< leb < næpæš hayya
[knows, thinks
becomes like ælohim]
giants
Mouth
return to / be a vagrant / form (yaṣar)
grow thorns „ for you
curse / drive from
curse
Man
speak
Woman
ADAMA
ADAM

taken and to which he is also always related. Perhaps the accompanying sketch is difficult to understand because it has so many lines. Let me give a brief explanation. The triangle has three central points: Aelohim, Adama, Adam. In all the primeval narratives of J, Adama is named along with the human actors. Its part is not equal to that of man but it should never be overlooked.

Every human deed – every good and evil action – touches not only God or our neighbour: it also touches the earth. The fate of humanity is also bound up with the earth in fortunate and unfortunate ways. I have gathered together the large number of different verbs which are used in J to describe the connection between man and earth. Naturally in such a sketch I have had to simplify. First, it is impossible to show all the verbs. Second, the position of the animals especially is not easy to indicate. Sometimes they seem to stand with Adam over against Adama (6,7); sometimes they belong to the Adama. Third, the multiple possibilities among human communities must be left out. Fourth, the change in the structure of human existence between the time of the (first) creation and the establishing of nations on earth after the flood is omitted. This sketch may be useful nonetheless.

Between the three centres I have drawn a direct line to show the speech-level, as it is a somewhat neutral one. Speaking is possible in principle not only between man and man or between man and God, but also between man and animal (even if it is a serpent). Speaking also occurs from God to animal, but not vice versa. As an upper curve I have sketched positive actions and reactions. Positive turns from Yahweh to Adam are not only man's making but also receiving of offers, hearing etc. Corresponding to this on the side of man is hearing in the sense of obedience or worship. Far more positive actions are mentioned regarding the relation of man to Adama: many kinds of working, building, tilling the soil. The last point is remarkable. To till means in Hebrew to serve the earth – the same term 'abad is used in relation to God for worshipping! The labour of the farmer is not understood, if it is thought of in terms of exploitation. To cultivate the earth means to help it to reach its own destination. If men keep company with Adama in the right way, then it reacts positively and man may eat of the earth or receive its strength (wealth in NEB).

The lower curves represent evil actions and reactions. Between man and Aelohim these may be sin with its consequences; Aelohim responds by driving man out off the garden of Eden or putting him to death. Between Adam and Adama there are evil forms (jesaer) originating in the thoughts of leb which destroy the earth, in Genesis 6 e.g. they cause indirectly the flood. Earth reacts by growing thorns and thistles.

Of special interest may be the actions from God to man which go through the earth with good or evil effects, e.g. God's cursing the Adama on man's account. Likewise an offering brought by man to God, means bringing the fruit of Adama to her creator. I have used special coloured strokes for demonstration of events which combine all the three centres.

Certainly, J's view on Adam and Adama is in many regards embedded in a "Weltbild" of ancient Near Eastern antiquity. It could not be the ours in detail. Nevertheless it is a rather sophisticated view of the ontological presuppositions of human existence and human history which is always history of Adama too. In this concept man has a special position. He is the only one among the creatures who has eaten from the tree of knowledge and who knows good and evil. Man alone is prepared to enter into a convenant with God. But he remains nae pae š hayya and belongs to the community of all animal beings. And he remains dust, and this includes the matter, which constitutes him, but also the necessity to receive his strength again and again from Adama. To act responsibly is his task, and he is responsible not only for his human society but also for his earth.

2. Genesis I and IX

To speak about nature in the Old Testament is to speak about the first chapter of Genesis. In our time, in contrast to former centuries, it is not the question of the origins of nature and man which is troublesome. The question in the early 19th century was how to reconcile the seven days of creation with the immense eras of evolution depicted by modern science. How to answer the Darwinian theory of the evolution of man and animals with a biblical view of man as the sole image of God – that was the question in the late 19th century. But today the debate centres around the relation between man and earth in Gen. I 28, the *dominium terrae,* as God's blessing at the time of the origin of humanity:

> Be fruitful and increase, fill the earth and subdue it, rule over the fish in the sea, the birds of heaven and every living thing that moves upon the earth.

In recent decades, some theologians, such as Gogarten and Harvey Cox, have stressed the fact that here we find a revolutionary utterance. Nowhere in Antiquity, including the Greek philosophers, was the absolute dominance of man over the world as a whole formulated in such a decisive manner. For all other civilizations and religions, the earth was filled with numinous powers. Since outside of Israel people often believed that mountains, wells, trees and many animals had a sacred dignity of their own, they had to live circumspectly in company with them. But the priestly writer demythologizes this numinous respect for some parts of creation. In his view, man becomes ruler of the earth in its totality. As I wrote some years ago: "In Genesis I the whole programme of modern natural science and technique lies, in nuce' before us!"

But now we have fallen into some disrepute. Lynn White has tried to prove that all modern destruction of nature and pollution of the environment result from "the orthodox Christian arrogance toward nature" and especially the compelling imperative of Gen. I 28! What has for so long been the source of pride for theologians in their relations with modern science is now becoming a matter of embarrassment. Had Roger Bacon really detected the true meaning of P, when he inferred from Gen. I the modern technological approach to nature?

So the Old Testament scholar is urged to go back to Gen. I to search anew for its original intention. Does the priestly writer mean that earth and nature are delivered over to the absolute power and pleasure of man for his exploitation? Christian theologians at one time took this chapter as a self-sufficient entity, isolated from its function within a larger literary work which focuses on the process of Heilsgeschichte (salvation history). We also tend to remove it from its place in the history of Hebrew thought and literature. I think it is necessary rather to put it in the context of related Old Testament literature. Gen. I is not the first word of the Old Testament nor the last. So it does not seem appropriate to me to start with the priestly account of creation but with the older Yahwistic text. And I shall try to go a step further on this when I have done my duty by Genesis I.

"Subdue the earth, rule over the fish, the birds and other animals." "Subdue" is the right translation of the original Hebrew text. The Hebrew *kibbes* means violent action, to make someone a slave, to use someone's labour and efforts. *Kibbes,* however, is limited to action related to soil and plants. The Hebrew verb *radah* is used to de-

cribe man's behaviour toward animals – a quite different relationship, although it does include subjugation and integration into man's dominion. But it is important that God's speech about subduing and ruling does not end with this sentence in V. 28. It goes on in V. 29 which brings precision and important restriction:

> I give you all plants that bear seed everywhere on earth and every tree bearing fruit which yields seed; they shall be yours for food.

Plants shall be yours for food. This is the effect of subduing the earth. But only plants! According to P, when God had finished his creation and saw that everything was good, man was to be a vegetarian. Rule over the fish, the birds, the wild animals, did not include killing them for food. Dominion in this context is really restricted. One may wonder what dominion over wild animals could mean without tracking down, killing and consuming! James Barr in his fine booklet, *Man and Nature* (BJRL 55, 1972), conceives of man's position as that of a shepherd-ruler, a conception so common in antiquity. But how can man be a shepherd of fish in the sea or the birds of heaven? Even in our advanced times, it would be extremely difficult for human beings to lead them and to feed them! So I look for another solution. Related to the Israelite and ancient Near Eastern respect for kingship is a concept which is expressed in Hebrew as *mischpat* and *sedaqā*. These two words are usually translated as "right" and "justice". This is very inadequate. *Sedaqā* especially is a very complex idea and is hardly translatable by one modern word. It includes not only positive social actions and behaviour but also the salvation and welfare which result from those deeds for the doer himself. *Sedaqā* is a kind of invisible sphere which surrounds the doer and determines his fate in the course of time. This sphere of deeds encompasses his whole social and natural environment. The *sedaqā* of the king and ruler is decisive for his whole people. Let me quote Ps 72,1f., a prayer for the king of Jerusalem:

> O God, endow the king with thy own justice (*mishpatim*) and give thy righteousness (*sedaqā*) to a king's son. May hills and mountains afford thy people peace and prosperity in righteousness (*sedaqā*)

Here the hills and mountains are endowed with *sedaqā*, if the king extends the sphere of *sedaqā* all over his land. In other parts of the Old Testament, the righteous king is like a huge tree, and all birds roost under it (Ezek. 17, 23; Dan. 4,9). I doubt that such sentences are purely metaphorical. It is rather the ancient Near Eastern and especially Hebrew view of man as a being who throughout his life is on the way from an incomplete beginning to perfection. When God creates man, he does not create a perfect *physis* in the Greek sense. He creates him as a kind of project who must find his way to completion (in Hebrew *tamam däräk*) by *sedaqā*-deeds. But the fruit of man's deeds are not only for himself. By his good or evil deeds he shapes the fate of all subjects who depend on him. The saddiq-father restores (shub) in *sedaqā* to his house, i.e. to his family, his servants, his cattle and fields. The saddiq king brings *sedaqā* over his people and land, and not only through conscious acts of government but also by a kind of contagious power.

It is in this direction that we should look for the meaning of dominion in Gen. I. If we want to interpret it adequately we cannot read V. 28 without taking V. 29 into account. It is a highly responsible rulership which is conferred upon mankind, one in which there is no hint of exploitation.

But Gen. I refers to the beginnings of time and does not describe the present state of affairs. In the view of P, between the seven days of creation and our history lies the flood. The flood was necessary because man's rule over himself and over the animals did not function. After the first centuries of primeval history, the result was negative (Gen. 6, 11-13):

> "Now the earth was corrupt in God's sight, and the earth was filled with violence. And God saw the earth, and behold, it was corrupt; for all flesh had corrupted their way upon the earth."

This passage is instructive with regard to P's view of the connection between the deeds and fate of humanity, of the interdependence between man's action and God's action. Not only mankind but all flesh has acted corruptly and made for itself an evil sphere which now is coming to an end. God's reaction corresponds to the action of his creations and will come upon them through their own works: God will corrupt them also.

God's original intention had been to establish in such a way the creation that violence would not occur (Hb. *hamas*), and that it would take a positive direction. The dominion of man over animals had seemed to be the right way. But this kind of relationship between man and the living parts of the earth did not succeed. A partial cancelling of this arrangement – the flood and the destruction of all existing creatures – and a new start on other principles seemed appropriate. The new start is marked by the covenant with Noah – but not only with Noah and his descendants, i.e. mankind, but with every living creature. Birds and cattle and wild animals are implicitly included. There is no separation among living creatures by which only man is in contact with the Creator.

Nonetheless the difference between man and the animals – cattle excluded – is deepened. The blessing of the beginnings is repeated, but with significant alterations:

> "Be fruitful and multiply, and fill the earth. The fear of you and the dread of you shall be upon every beast of the earth, and upon every bird of the air, upon everything that creeps on the ground and all the fish of the sea; into your hand they are delivered. Every moving thing that lives shall be food for you; and as I gave you the green plants, I give you everything. Only you shall not eat flesh with its life, that is, its blood." (Gen. 9, 1-4)

No further word here on dominion! Now animals are given into the hands of men for food, thus to be killed. Every animal will fear and dread man. The conditions of man's dominion have changed. Does this include permission to treat animals as objects? Certainly not. Animals, like man, have a *naepaesh* – imprecisely translated soul. God does not give man power over the *naepaesh* of other living creatures. Every *naepaesh* has its direct connection to God and its own value which does not depend on human will or pleasure. Blood is the symbol of that value and man is not allowed to consume the blood of non-human beings. Christian churches have abandoned these restrictions. They have seen in these Old Testament prohibitions purely ceremonial laws, superstitious rituals, which we have overcome in the name of Christ and the freedom of the gospel. In doing so, Christian theology has established a fundamental difference between man and animal. Now animals are without a *naepaesh;* they are not directly related to God. Animals have become a part of nature, and nature as a whole has become mere raw matter for human culture and humanity's self-realization. Perhaps in the seventies of the 20th century we have reached the point where it is appropriate to question this way of thinking. Certainly it is not my intention to bring us back to obedience to the rituals of Old Testament time. But our manner of turning up our noses at every ceremonial law really looks like "Christian arrogance toward nature". This arrogance is not in accordance with Gen. 1; it is in contrast to the unity of human and animal life in the mind of the priestly writer.

3. The End of the World and Its Renewal in Apocalyptic Writings

The latest writings of the Old Testament are the apocalyptic books. Only a small number, foremost among them the Book of Daniel, are part of the protocanonical Holy Scripture. The majority belong to pseudepigraphical literature. Nonetheless they represent the last stage in the Old Testament view of man and his world. In many respects they are the bridge from ancient Israel to the New Testament and early Christianity.

The apocalyptic writings foretell the downfall of the world, a day of universal judgement and the creation of a new world. Such cosmic eschatology has its roots in some prophetic sayings, e.g. the prophecies about the Day of Yahweh and its meteological implications in Joel and Zephaniah 1 or about the peace among animals in the messianic era in Isaiah 11. The apocalyptics, however, have brought together those aphoristic prophetic utterances and elaborated them into an eschatological system. Their ideas about the growing depravation in the moral and natural conditions of the world in the final days which are coming and, in connection with that, the ideas of God's Kingdom in a new world, have become the foundation of traditional Christian eschatology.

In the presence of modern natural sciences, most of our current theologians refrain from speaking about the eschatological fears and hopes of our fathers. It sounds old fashioned to talk about an end of this world and the creation of a new one. As a rule, we leave these themes to Jehovah's witnesses and other sectarians. Many of my colleagues, both in Old Testament and New Testament exegesis, deny any value of the apocalyptic writings. But if we look at man's position in nature – and that means in creation as a whole according to the Holy Scripture – it is indispensable for us to examine also the apocalyptic texts.

I select one passage from the II (IV) Book of Ezra (Esdras) ch. 5, 1-11.

> "But now to speak of the signs: there will come a time when the inhabitants of the earth will be seized with panic. The way of truth will be hidden from sight, and the land will be barren of faith. There will be a great increase in wickedness, worse than anything you now see or have ever heard of. The country you now see governing the world will become a trackless desert, laid waste for all to see. After the third period (if the Most High grants you a long enough life) you will see confusion everywhere. The sun will suddenly begin to shine in the middle of the night, and the moon in the day-time. Trees will drip blood, stones will speak, nations will be in confusion, and the courses of the stars will be changed. A king unwelcome to the inhabitants of earth will succeed to the throne; even the birds will all fly away. The Dead Sea will cast up fish, and at night a voice will sound, unknown to the many but heard by all. Chasms will open in many places and spurt out flames incessantly. Wild beasts will range far afield, women will give birth to monsters, fresh springs will run with salt water, and everywhere friends will become enemies. Then understanding will be hidden, and reason withdraw to her secret chamber. Many will seek her, but not find her; the earth will overflow with vice and wickedness."

Typical apocalyptic motifs are gathered here. The growing corruption of human society goes hand in hand with natural disturbances: darkening of the stars, fire on large parts of the earth, terrible changes in salt and fresh waters, the birth of monsters, etc. Other apocalyptic texts list further signs of disaster which belong to the time of the end of the world: pestilence, drought, sterility.

The signs of the end in the apocalyptic writings around the beginning of the Christian era correspond to similar notions in ancient astrology. The Second Epistle of Peter, under the influence of these writings, predicts the burning of the world as the culmination of a growing disaster, just as Plato, influenced by astrology, does in his Timaios. But there is one decisive difference. Whereas astrology looks for a coming Ekpyrosis according to the laws of nature which are totally independent of human behaviour, the apocalyptic writings foretell a future which at every stage is connected with the deeds of mankind as a whole. Certainly, the relationship is not as direct as in the Yahwistic Urgeschichte. The signs of the end form the link in a chain and inevitably culminate in a universal catastrophe. But man's responsibility is insisted upon throughout. The stars may rule over the course of nature and also over normal events, but the course of the stars is not independent of Adam's fall. Human rulers, the constitutions of the Kingdoms and the world-wide power of the last monarchy oppress not only their citizens but also animals and the earth. And the kings of earth are in communication with their heavenly counterparts, the astral angels of the nations (Dan. 10).

A note here regarding the concept of Judgement. Most Christian theologians think of eschatology as a transcendent event in terms of judgement with God as supreme judge. I would not deny that in the apocalyptic writings the notion of a last judgement plays a part. But it is by no means central. Cosmic eschatology in the sense of the apocalyptic writings and of Holy Scripture as a whole does not presuppose a day X, when suddenly and unexpectedly the Lord will press the button. Certainly the Last Day cannot be calculated. On the contrary, it is the goal of the evolution of mankind and nature.

The apocalyptic writers are commonly thought to be pessimists. They do indeed speak very often about coming disasters and catastrophes. But on the other hand, they express positive hopes for a restoration after the Last Day and the return of Paradise. The fate of mankind and the fate of earth, anthropology and cosmology are connected here too. Take this passage from 2 Baruch, ch. 73-74, 2:

> "And it shall come to pass, when He has brought low everything that is in the world,
> And has sat down in peace for the age on the throne of His kingdom,
> That joy shall then be revealed,
> And rest shall appear.
>
> And then healing shall descend in dew,
> And disease shall withdraw,
> And anxiety and anguish and lamentation pass from amongst men,
> And gladness proceed through the whole earth.
>
> And no one shall again die untimely,
> Nor shall any adversity suddenly befall.
>
> And judgements, and revilings, and contentions, and revenges,
> And blood, and passions, and envy, and hatred,
> And whatsoever things are like these shall go into condemnation when they are removed.
>
> For it is these very things which have filled this world with evils,
> And on account of these the life of man has been greatly troubled.
>
> And wild beasts shall come from the forest and minister unto men,
> And asps and dragons shall come forth from their holes to submit themselves to a little child.
>
> And women shall no longer then have pain when they bear,

Nor shall they suffer torment when they yield the fruit of the womb.

And it shall come to pass in those days that the reapers shall not grow weary,
Nor those that build be toilworn;
For the works shall of themselves speedily advance,
Together with those who do them in much tranquility.

For that time is the consummation of that which is corruptible,
And the beginning of that which is not corruptible."

These are doubtlessly very delightful prognoses for our future, including the future of the earth. Fertility and health increase in an amazing way. With the sensual is also the moral: no negative passions, no bloodshed, no evil at all! Against this background the resurrection of the dead is expected, a resurrection that means more than the immortality of the soul: it means eternal life in a glorified body. This existence of man as a person in a glorified body also presupposes the glorification of the earth on which mankind is to live.

Many things could be said about the implications of the apocalyptic view of the relation between man and nature in this aeon and in the future aeon. The role of the Son of Man, sometimes called the Messiah, is important, because he will be the new Adam who will establish the right rule on earth. This coming rule will extend over mankind as well as over the animals; so it is depicted in the symbols of paradise. The relationship between the deeds and the fate of every human being continues. The righteous takes his deeds with him into the coming new world, and the wicked is driven by his deeds to Gehenna.

These and other ideas of an apocalyptic eschatology are suspect for many exegetes. They sound mythological, and in a rather non-scientific way relate the course of nature to human fate. As Bultmann wrote in his famous programme of demythologization, every rational being is convinced that the world will continue along the course it has followed until now. Are we today as convinced of this as was the generation of our fathers, Bultmann included?

Many of the apocalyptic predictions have a horrible actuality, e.g. poison in the waters, deadly dust out of the clouds. Others seem possible in the near future: darkening of the stars for human eyes, poisoning of the atmosphere, huge fires over large parts of the earth. Sometimes one wonders if the apocalyptic descriptions of the future of this earth are terrible enough. But let us not forget that these texts also predict a positive evolution of earth which perhaps can also be realized in the future: painless birth, miraculous fertility of the soil, toil without thistles and thorns on the land (Genesis 3).

My intention is not to convert you to apocalypticism. In many details, these texts have been surpassed by events. Their speculations about the time of the end of the world have been proven false by the course of history. But they consistently stress the point that human existence before God and human existence within this world are indissolubly connected. So the history of mankind includes the history of nature and vice versa. The same God is operative in both. Salvation is not only for pious individuals; it includes the liberation of all creatures. In the last centuries Western Christianity has abandoned these biblical insights and delivered all competence in knowledge about nature to natural science and technology. Perhaps the ecological crisis has been necessary in order to call theology back to a field which it has wrongly neglected. It cannot speak convincingly about salvation if it does not have enough to say about creation. In the view of the Old Testament, however, creation did not take place; it continues in the process of history. In the mind of the biblical authors there is no human history that is separated from the history of nature. If, as some exegetes assert, they speak at all of revelation and the relationship between God and men in terms of history, that history is about the fate of mankind in relation to the fate of the world.

THE ORGANIC IMAGE OF NATURE, HUMANITY AND GOD

Charles Birch

"Let those who would pry into the mysteries of the life of God, realize just how little they understand of the mysteries of the life of an ant."

Gregory of Nyssa

The questioning of man's existence, of how he came to be and of his relationship to the rest of nature in the early chapters of Genesis did not arise, says Westerman (1974, p. 71), out of any theoretical interest "but out of a state of human existence seen as threatened". There was, at one time, a struggle to the death between man and beast. "It ended not with the extermination of the animals, but in a life together. And it is here that man learnt what dominion is" (Westerman, 1974, p. 58).

Once again human existence is threatened. This time not by wild animals but by humankind itself. Humankind is now a threat to the whole of creation, its plants, its animals, its skies, its seas, its earth and all that is beneath the earth. We take away resources from the earth. We give back poisonous wastes. The technology that brought affluence to a minority of people on the earth now threatens the demise of all. It is this threat which drives us once again to ask the same questions posed in the book of Genesis. What are we here for? What is our relationship to nature? What images of man and of nature can bring some promise of the possibility of liberation of man and of nature and of the possibility of life together on this planet?

The threat to nature

The Fifth Assembly of the World Council of Churches at Nairobi in 1975 accepted the proscription that we are on

a route of global ecological unsustainability and distributive injustice both within nations and between nations. There is over-utilization of material resources, under-utilization of human resources and grave inequalities in the distribution of the production of the earth. Secondly the Fifth Assembly pointed to the prescription: an ecologically sustainable and socially just global society. That is a goal, not a programme. The programme has yet to be devised. Thirdly, it called for the discovery of a new and compelling vision of the relationship between humanity, nature and God. In the concluding section of an address to the Assembly I said, "What is needed is a fearless pursuit of the meaning of the unity of nature, man and God in the light of both science and a wider ecumenism that includes African and Asian cultural ideas. They (the churches) would then, I believe, see more clearly than they do at present their total responsibility to replenish the earth for the sake of all humanity and all creatures, while there may yet be time." (Birch 1976a)

What I have said implies that there is a connection between our image of nature and the way we use nature. I believe this thesis can be defended, though it may be difficult to lay the blame for the abuse of nature on any particular philosophic point of view at any particular point in history [see for example Passmore (1974) and Moncrief (1974)]. Whatever its source, an ideology of nature that ascribes no more than instrumental value to the non-human creation leads to exploitation of the resources of the earth. The present fate of the whales is an example. A few years ago the case for conserving whales was based largely on the argument that humanity would benefit more from whaling if the annual cropping were kept to what is called a "sustainable yield". There seemed no point in killing the goose that lays the golden eggs. The two main whaling nations were never enthusiastic about limiting their annual catch to any agreed quotas. The reason may now be clear. According to some calculations of some whaling authorities, the maximum economic gain would be achieved by killing as many whales as possible within the working life of existing fleets even though this could mean the end of whales for all time. If that is true, then there is no pragmatic case for saving the whale. If the whale is to be saved, it will have to be on some other grounds. There are probably no other grounds than the intrinsic value of whales themselves. Hence the "save the whale" campaign around the world inspired by a few people who think whales have a right to life. But how many people think that way? For most of us, nature is there for us to use. Its value to us is an instrumental one.

Watts (1976, p. 48) tells the story of a mythical king of ancient India, who, oppressed by the roughness of the earth upon soft human feet, proposed that his whole territory be carpeted with skins. However, one of his wise men pointed out that the same result could be achieved far more simply by taking a few skins and cutting off small patches to bind beneath the feet. This is a parable of two different attitudes to nature. In one, man adapts nature to himself. In the other, man adapts himself to nature. Science and technology have spent much effort in adapting nature to man and little in adapting man to nature. In the parable, the technically skilled solution is the one in which man adapts himself to nature. Super-star technologies tend to be the other way round, as witness the appalling long-term consequences of nuclear explosions and the effects of leakages from deposits of radio-active wastes from nuclear power plants. One of the reasons why small is beautiful in technology is that small is less violent to nature.

The motivation for gentler technology is still largely pragmatic. In the long run, it will be to human advantage. For similar reasons practical ecologists invoke the argument of "The tragedy of the Commons". In the long run, it pays to keep the commons intact but in the short run that does not give the maximum gain to the individual. The motivation of the ecology movement is the realization that human adaptation of nature to human needs can be destructive to both. The problems arising from technology and mismanagement of the environment cannot be solved only by the application of more and better technology. Improved technology may be part of the answer, but to suppose that the problems of technology can themselves be solved purely by technology is self defeating. Softer technology helps but it will not redeem the world.

Two weaknesses of the ecology movement

The ecology movement has two weaknesses. One is that all the effort and activity of the environmentalists do not add up to make a significant difference to the existing socio-economic paradigm. (Skolimoski, 1976). The second is that the movement has not made any basic change in the conceptual framework of our image of nature. This is still largely mechanistic and technocratic.

Concerning the first deficiency of the ecology movement, the existing socio-economic systems of both capitalism and socialism have been designed without any concept of limits to economic growth. They are based on the twin illusions of infinite economic growth and an infinite environment. An implication of the ecology movement, on the other hand, is an ecologically sustainable society in which growth in some things is curbed and there is a redistribution of the results of the productive efforts to create greater justice. Ecology and justice must be seen together. We have to end the exploitation by people of nature and of other people. Some of the practical requirements are clear enough; population of a size consistent with the capacity of the earth to sustain it and use of material resources at a rate that can be sustained without damage to nature. What is not clear is how these and other requirements can be built into a new socio-economic paradigm, a new international economic order. Perhaps we shall learn most from countries where the resource pinch is now most severe, and which are looking for new directions, countries such as Sweden and the Netherlands.

What is wrong is the relations between the three systems – the production system, the economic system and the ecological system. Barry Commoner has put it like this. It would appear that the economic system should conform to the requirements of the production system. In other words, we should have as our objective a production system which meets human need and the economic system should be geared to do just that. Secondly, the production system should conform to the requirements of the ecological system. That is the rational ideal. In reality the relations are the other way round. The environmental crisis tells us that the ecological system has been drastically affected by the design of the production system which is determined by the economic system with almost no regard for the ecological system.

The second deficiency of the ecological movement is its lack of a metaphysics or theology, be it religious or secular, which could give compelling motivation to work for the practical objectives and a philosophical unity that could have charismatic appeal. Classical Marxism provides a secular theology with its programme for social and economic reform. Capitalism did so with its theology of material progress reinforced by a psychology adumbrated by Adam Smith which claims that the pursuit of self-interest by each individual rebounds to the benefit of all. If Adam Smith is forgotten today Ayn Rand fills the gap with her theology of human selfishness.

But where is the image of nature and humanity that can give force and meaning to the ecological necessities and their socio-economic implications: the ecologically sustainable and socially just global society? Where is the image of the nature-human nature relationship radically different from that undergirding our present dominant socio-economic systems?

Two obstacles to a unitary image of nature, humanity and God

(1) The fallacy that religion and science have to do with two different areas of knowledge. This was the gentlemen's agreement reached by science and religion after the conflict of religion with Darwinism in the 19th century. There is a quantitative world which can be measured and with which science deals and there is a non-qualititative world which cannot be measured and which is religion's domain. The two realms barely meet, let alone overlap. This bifurcation of nature depended on the notion that science dealt with the solid objective world and religion had to do with subjective experiences of people. The false dichotomy is shattered by the realization that science and religion both start with experiences. Indeed the root meaning of experiment is to create experiences. There are some experiences that science can handle with great effect and others which it can scarcely handle at all. That was the main point of Monod's *Chance and Necessity* (1971) in which he invoked Popper's "principle of demarcation" to delineate the testable from the non-testable. Science is highly successful in the area of the testable. However, the point of Popperian cut-off is somewhat arbitrary. Furthermore, one can dispute that testability is the only criterion for the validity of an idea. There are others.

A peculiar variation of the bifurcation of knowledge syndrome is the view that science does not tell us the way the world is in a sufficiently fundamental sense to come into conflict with the necessary presuppositions of religion. This is taken by some as a green light for each to pursue truth independently of the other. The inevitable result is to divide knowledge into scientific and religious with little in common between them. This is virtually to preclude the possibility of discussing a unitary view of nature, humanity and God. There may not even be such a unity.

An alternative view which is more conducive to discovering a unitary view of nature, humanity and God is that objects cannot be divided into quantitative and qualitative but that elements of both reside in all. The quantitative is an abstraction. An atom or a human being can be viewed from more than one perspective. This organic view of nature is discussed later.

(2) The failure to distinguish between mechanism as a methodology and mechanism as a metaphysic. Science is highly successful in analysing objects from electrons to people as if they were mechanisms. This is sometimes called the process of reductionism. The conduction of a nervous impulse is explained in terms of models in physics and chemistry. The operations of the heart are interpreted in terms of a physical pump. The success of the methodology is no reason for concluding that the objects so analysed are mechanisms. Mechanism is an abstraction from "organism". Mechanistic science says not a sparrow falls to the ground but the machine slaps it down and takes its identification number.

The organic model does not deny mechanical aspects of nature but these aspects are not seen as making up the whole nature of the organism. The death of even a sparrow may count in the heart of things. The living organism is equipped with pumps and levers and computers and chemical factories which are its mechanical aspects. The living organism has also its subjective aspect – what it is to itself. For ourselves this is the private knowledge we have of our own feelings, my knowledge of what it is to be me. We cannot deny the possibility of subjectivity in other living organisms such as sparrows, or for that matter in non-living entities such as electrons. Nor can we of course assert this for anything but ourselves.

Mechanism applied as a metaphysic leads either to a bifurcation of nature into the material and the non-material as two separate aspects of existence or to materialism that affirms that anything which is not measurable is not real. The world and all that is in it are contrivance and self-contained, that is to say non-contingent. This is the prosaic fallacy. Curiously this is the direction theology took in the deistic view of creation. The universe is contrivance or machine. God is the *deus ex machina.* God is outside the machine. He made it in the first place but its existence is no longer contingent upon him. While this view may no longer be supported in reputable schools of theology, it is widely held by Christians. It is a popular view of creation. According to Lynn White (1975) in the 14th century dualism between God and nature was codified by theological conservatives who were trying to defend the doctrines of God's transcendent power and of revelation.

In the same century, the learned French Bishop Nicole Cresme conceived the metaphor of the clockmaker God who had created the universe as a perfectly coordinated machine, operating perpetually because its spheres turned without friction. The notion of *machina mundi,* the cosmic machine, spread rapidly. Galileo's unification of celestial and terrestrial physics in the 17th century brought mechanization out of the heavens down to earth. In the same century, Descartes decided that all animals were mechanisms devoid of intelligence and feeling. God was now the skilled artificer of biological automata. "This long process", says Lynn White (1975), "culminated in the early 20th century with Bertrand Russell's heroic despair. He spoke for millions when he declared the universe to be a vast senseless machine grinding on from nowhere." He sees Russell as marking the culmination of a schism between our understanding of nature and our understanding of human nature that began some 650 years earlier in a theologically motivated effort to salvage revelation and the transcendence of God.

God as *deus ex machina* was not of course invented in the 14th century. According to Macquarie (1974), the dominant model of the relation of God to the world in the Old Testament is a monarchical one. God is a self-sufficient transcendent being who created the world by an act of will. There are in the Old Testament, however, at least traces of an alternative model which Macquarie calls the organic model. In this model, God and the world are not sharply separated. According to Macquarie, the impact of Greek rationalism on the early Church resulted in qualification of the monarchial model of God and a higher estimate of nature and the world, a continuance of which we find in Eastern Christianity today. As for the direction in which theology should now move, Macquarie has no doubts.

> "As far as Christian theology is concerned, my thesis is that we need to move away from the monarchial model of God toward the organic model. The monarchial model is deeply entrenched in much traditional Christian language, including the language of liturgy; it is widespread in popular theology, and it is encouraged also by those forms of biblical theology which try to exclude all philosophical influences and to found themselves on revelation alone. On the other hand, as the crisis in theism in the past few years has shown, the monarchial model has become increasingly less credible to many people today. The organic model, by contrast,

has gained ground in philosophical theology, and I think most philosophical versions of theism today, even those that proceed from very different schools, are of the organic type."

It would seem appropriate for a biologist, which I am, to find the organic model of the universe congenial (Birch 1976). But in so doing I am in a minority among my fellow biologists. Most of them are still suffering from the shock of Darwinism. In making the *deus ex machina* no longer credible and bringing to the fore the role of chance and mechanism, Darwinism became for many the death knell of any model other than mechanism. However, the minority of biologists who find an organic model of the universe most consistent with their understanding of nature includes two of the most distinguished evolutionary biologists of this century, Sewall Wright (1976) and C.H. Waddington (1976). So I feel in good company.

Just when biology and psychology are moving closer to mechanism, physics is moving away from this model as a result of the breakdown of the traditional dualisms, space-time, matter-energy, organic-inorganic, mind-matter. If this trend continues, scientists will be regarding living beings as mechanical while supposing that inanimate matter cannot fit into the limited categories of mechanism!

Necessary components of a unifying model

Despite the uncertainties among philosophers of science as to what science is all about, it has a content which gives us reason to reject some cosmologies and to have greater confidence in others. The main way of dealing with science-theology issues is to talk about science and theology as ways of knowing. This is a subtle means of avoiding the major issues which can be dealt with only by focusing on what is known or claimed to be known. This is not, as some philosophers want to believe, close to zero! As a result of scientific advances, we can safely reject the medieval multi-tiered universe of Dante, the earth-centred universe of Aquinas, the billiard ball universe of Newton and the Laplacian universe of which it was claimed that if we knew every force at work in it we could predict its exact future. On the positive side, we are given a picture of the unitary nature of matter throughout the universe; the same atoms and molecules that make up stars also make up plants and animals. We have also a picture of a universe evolving perhaps from an all-hydrogen universe to differentiated ground matter to solar systems and galaxies to, at least one star on which life appeared over immense periods of time. We know something about the changes that led to humankind and of how genetical evolution in the human species gave way to cultural evolution. About origins we know little, be it the origin of the universe or of life or of humankind. The story we do have suggests the likelihood of a continuity in the evolution of life from the first complex aggregation of molecules to the human species. A biologist would select as the two great unknowns the origin of life and the origin of consciousness.

Biologists claim to know a lot about how organisms evolved. There is general, though not complete, agreement that the mechanism of evolution is that envisaged by Charles Darwin brought up to date, so to speak, by modern genetics. There are chance elements – gene mutation, and there are deterministic elements – natural selection. If there are purposing elements, they are not the entelechies envisaged by the early vitalists. Evolution is one unifying theory in biology. The other is the cell theory that all living organisms are made up of basic building blocks called cells. That is to say that the basic chemical processes of life go on inside cells whether it is the life of a whale or a single-celled bacterium. A problem is presented by viruses which are not cells, and so for convenience they are said not to be alive until they get inside cells. Then they become part of someone else's cells. Such "exceptions" are always the interesting cases as they give us clues to origins and continuities.

The content of science gives us a very different picture of the world from that of our grandparents, or even our parents. And the picture will continue to change, or perhaps develop is a better word. There is a present orthodoxy in both physics and biology. It is changed by the imaginative work of a few great minds penetrating the fuzzy boundaries of knowledge. It is a common mistake to suppose that the rapid advance in scientific knowledge makes it more and more difficult for us to know the content of science. The more we know the less we have to know. Advances in knowledge mean advances in generalisations. Copernicus replaces Ptolemy's myriad cycles by a single one. Darwin brings living diversity together under one umbrella. Molecular genetics provides a single, though complex, clue to all inheritance. Masses of detail give way to unifying principles. The universe becomes more like a universe with every new day in science. Its diversity becomes less, not more baffling. Its unity, like that of a kaleidoscope, incorporates many components that at first sight may seem opposites. There are plenty of cheap unitary images of the universe for sale. The price is the exclusion of significant aspects of the real world. I believe that any image that is worthy of serious attention must include the following components:

1. Deterministic aspects of nature and human nature

The bio-sociology battle rages over the extent to which human capacities and behaviour are determined by genes and the extent to which the human species is open to cultural and other influences. It is the old nature-nurture controversy in a new dress with political overtones. Some things are clear. The colour of my eyes is determined at conception. Whether or not I am a mongol child or an amaurotic idiot is determined by my chromosomes at conception. I may be a diabetic as a result of my inheritance. None of us chose to come into the world as we are. Nor did we choose the environment in which we were reared. A lot of the inherited differences between me and my colleagues may be of no significance, such as the colour of my eyes or of my skin. Others may be significant determinants in my life. Genetics teaches the inequality of humankind, a deterministic inequality. Indeed, no two individuals, except identical twins, have exactly the same genetic endowment. All of us are subject to the arrows and slings of outrageous fortune. Some gain, others lose. None of which means that freedom and choice are an illusion, that God has fixed it all, as the lines of the hymn say: "The rich man in his castle. The poor man at his gate. He made them high and lowly. He ordered their estate."

2. The existence of chance and accident

A major point of conflict between Darwinism and Christian theology in the 20th century was Darwin's emphasis on the role of chance in determining what we now call mutations. Mutations have causes but which sort of mutation occurs at any one time is quite independent of the needs of the organism at that time. By chance some may be beneficial and by chance most will be deleterious. It is an extraordinary fact that the mutations that confer on an organism resistance to the toxic effects of DDT occurred before DDT was invented. They were probably totally useless to the organisms which produced them until DDT became part of the environment. Or take another example. Every one of us is a chance collection of genes in the sense that many chance events were involved in getting that assemblage together. True

there are deterministic rules of genetics, but it was chance that gave us the line up of genes when the sex cells were formed. It was chance that got this particular sperm together with that particular ovum. There is a lot of indeterminancy in genetics just as there apparently is also in physics.

A train crashes into a bridge and I happen to be in a front carriage and am maimed for life. I may ask why should this happen to me. There is no answer other than this: when a train with people on it crashes, someone may be hurt. Accidents happen and they happen to anyone. A lot of the so-called evil in nature is the consequence of chance events. A lot of it is also determined.

3. Freedom and self-determination

The trouble about physicalism and pure mechanism is that it leaves no possibility of self-determination on the part of the creature, be it a human or a whale or an electron. God may determine or influence many things but a creature, at whatever level, that has no degree of self-determination is an automaton. Yet people who are thoroughgoing mechanists behave as if they believe they do have some self-determination. Life would be pretty empty otherwise. Is this an illusion of self-determination or is it real? I cannot wait for philosophy to make up its mind about whether I am free or not. I, and I suspect most of my colleagues, act in the faith that we do have some degree of self-determination. We must ask the same question of the rest of nature. What we come up with may be more in the nature of faith than demonstration. What can be said is that the existence of mechanical and deterministic aspects of nature does not rule out the possibility of degrees of self-determination as well.

4. The objective and the subjective

Science describes the outer or objective aspects of things. That is true of its descriptions of myself in terms of biochemistry, physiology, physics and chemistry. But there is also a private knowledge I have of myself which is what it is to be me and no one else. This inner subjective aspect of my life is less amenable to analysis, though just as real. Physics does not deal with feeling qualities, but that is no reason for asserting that feeling qualities do not exist. Professor Charles Hartshorne has given a brilliant account of these two sorts of knowledge which he calls physics and psychics in which he concludes that the most fundamental is psychics (Hartshorne 1976). This is, in many respects, the most controversial and yet the most critical issue we face in seeking a unitary view of nature, humanity and God. It raises the question as to how much of the universe experiences. Do only some entities experience? Do only living organisms experience? Do all organisms living and non-living experience? What is it they experience? Is feeling a feeling of a feeling? Does God experience? How much does God experience? Does his experience include the good and the bad experiences? What has happened to all the experience of the ages since time began? Does God remember it all? Is some of it saved? Is none of it saved? Does God experience at an instant happenings spanning the ends of the earth or the ends of the universe? Are a thousand years of experience as of yesterday? What questions! We find them in the book of Job. We find them in Paul's cosmological speculations. They are critically important questions. We have to keep on raising them and exploring for answers, even tentative answers. But we seem frightened to adventure so far into the unknown. If we can have a dream about the sustainable and just society on earth, why not dream also about the foundations of the cosmos and the ultimate meaning of it all? Ultimately I believe we need the one to bring life to the other. It is going to be a pretty dull sustainable world if all that is left to do in it is to play with certainties and security.

Where to look for an organic model

The monarchial model is quite sterile as an approach to a unitary view of nature, humanity and God. What we have to look for is some sort of organic model. We do not find it in the mainstream of Christian theology or the mainstreams of western philosophy. But there is a stream of thought which provides an alternative model. At times it has come to the surface; at other times it has been mostly an underground stream. We have to bring it to the surface once again for new is the fullness of time.

Hartshorne and Reese (1953) trace the origins of the organic model back to Ikhnaton, and to the Vedic hymns of Hinduism. In Greek thought, it was the Platonic tradition that contributed most to the organic view of nature. Defending Plato against the atomists, Cornford (1967) wrote,

> "It seemed to him that a theory which reduced all reality to little bits of dead, impenetrable body, moving chaotically in a void, could not account for an ordered universe or for the phenomena of life, including our own minds with their throughts and feelings. And, whatever materialists may have believed a century ago, no one, I suppose, now holds that all these phenomena can be satisfactorily explained in terms of an unlimited number of billiard balls, banging about and colliding in empty space."

As Montefiore et al (1975) point out, the Bible, particularly the Old Testament, contains a diversity of viewpoints on the relation of God to nature. There are at least elements of an organic view particularly in the Psalms, the book of Job and some parts of Malachi. The symbolic accounts of creation in the New Testament, in the prologue of St. John's gospel, in Colossians I and in Romans 8 can be interpreted in this way, though doubtless there are other possible interpretations of such high symbolism. Sittler (1962) certainly considered such passages as providing a vision of God as involved in nature, as sustainer and lure and as responsive to all that happens in nature. Sittler saw this as the necessary element which was missing in current theology. "The address of Christian thought" he said, "is most weak precisely where man's ache is most strong".

In the second and third centuries, the church fathers Justin Martyr, Irenaeus, Clement of Alexandria, Origen and others brought together Greek and Christian insight in what at least one theologian (Raven 1936) regarded as one of the noblest periods in Christian thought about nature. It found its most important expression in Origen who produced the first great theological system. Like his teacher, Clement of Alexandria, he was a Christian Platonist. He had a scientific theology which embraced the whole universe (Tillich 1956, pp. 55-62). He thought of nature as an organism, as the following quotation illustrates: "As a body is an organism made up of many members, and it is held together by one soul, so, in my opinion, the whole world is a kind of huge and immense living creature which is united by one soul, namely the power and reason of God." (Bettenson 1956, p. 260).

The Cambridge Platonists in the 17th century protested against the mechanistic model of the universe. Ralph Cudworth wrote in *The Intellectual System of the Universe* in 1678, "The root of all atheism consists in making senseless matter the only self-existent thing, and the original of all things... and mind as nothing but local motion in the organic parts of a man's body." He wrote of the reality of mind as the ground of all that is. He also showed the impossibility of resolving within the context of the monarchial model the dilemma of evil in a universe created by a good God.

At the time that Newton was devising his mechanical picture of the universe and trying to fathom what was left for God to do in such a universe, two of his contemporaries, Spinoza and Leibnitz, were devising a very different organic model of nature. Schelling, Fechner, Pfleiderer, Peirce and Varisco are in the same stream (Hartshorne and Reese, 1953).

The English nature poets of the 17th and 18th centuries were part of what A.N. Whitehead has called the romantic reaction to the mechanism of scientific models. "We murder to dissect," wrote Wordsworth, or as Whitehead said later, we commit the fallacy of misplaced concreteness. "We gain from these poets," said Whitehead (1926, p. 26), "the evidence that a philosophy of nature must concern itself with these six notions: chance, value, eternal objects, endurance, organism, interfusion."

In modern times, we find this emphasis in Berdyaev, Schweitzer, Temple, Buber, Radhakrishnan and the Moslem Iqbal. But towering over all is A.N. Whitehead. It is from him and his students such as Charles Hartshorne and his students such as John B. Cobb, (c.f. Cobb and Griffin, 1976) that we have had the most profound thinking in our time on a metaphysic of nature and God. Whitehead conceived of the universe in terms of organism and of its building blocks in terms of smaller organisms. The experiencing living organism was the model for all entities, not the dead billiard balls of Newtonian physics. From his understanding of relativity physics and evolutionary biology, he conceived of reality as process at every point in space and time. And at every point in space and time God is involved in that process. This is an experiental universe. God is both provider of experience and himself the experiencer of all other entities from electrons to people. This is his twofold nature: his primordial nature wherein he provides the possibilities of the future and the lure of creation, his consequent nature which is his experience of creation. He not only affects the world but is affected by it. God is not before all creation but with all creation. It is impertinent to summarise even so few points in Whitehead's scheme so briefly. But I would like to feel that even a brief reference might stimulate others to pursue him further. It is not simply a matter of pursuing Whitehead but the stream of thought which stems from him which some call process philosophy and process theology. I confess to having become stranded as a graduate student on the island of mechanism. I was saved from this arid island by what at the time was an illuminating discovery for me, A.N. Whitehead's *Science and the Modern World* and Charles Hartshorne's *Philosophy and Psychology of Sensation.* They were for me the beginning of a voyage of discovery on a great ocean, one that was much more adventurous than was ever possible on my mechanistic island.

But I now ask myself this question: If this approach is so illuminating and motivating for me, why has it not caught on in the world of science and of theology and in the world of just ordinay people who want to find meaning in existence? No doubt there are many reasons. One obvious one is the obscurity of a good deal of the writing of process thought. It may not be obscure to process thinkers but it certainly is to others.

What I would like to do, but I do not know how to do it, is to make this framework of thinking relevant and accessible to anyone who lets himself be concerned with the problems of the ecologically unsustainable and socially unjust global society. Some modern parables are required that will tell the story or at least the first chapter of the story, for that is all that is written so far. We need the modern equivalent of the mosaics of the Byzantine churches such as the image of God and nature depicted in the great mosaic of San Clemente in Rome. From the central cross there springs a vine whose coils embracing every creature extend to the uttermost corners of the universe.

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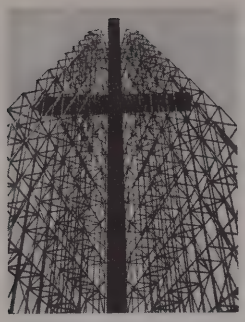


GOD AND NATURE

Charles Hartshorne

What does God do in or to the universe? Before considering this question, I wish to remark that the final thing God does is not done in or to but *with* the universe. He cherishes it and thus makes it contributory to his own life. The ephemeral creatures thereby acquire everlasting significance, which they could not have simply through themselves and their fellows. My parents believed in personal immortality, as they did in the physical resurrection of Jesus. Philosophical training and long exposure to scientific and philosophical thought have, for better or for worse, led me to make a sharp distinction between belief in the primordial and everlasting reality of a God of love and the validity of the two great commandments, love God with all your mind and heart and soul and strength and your neighbour as yourself, beliefs capable of reasonable defence according to my standards, and some other traditional doctrines accepted by my truly and wholesomely pious Episcopal parents, doctrines with which I have philosophical and indeed religious difficulties. These include personal immortality as usually understood.

I agree that if God loves us he will not destroy us, but what is the "us"? I take our earthly life to be our reality. As the poet Frost says, "Earth's the right place for love I don't know where it's likely to go better". But our earthly experiences are not annihilated as they fall into the past and are perhaps forgotten by us and other human persons. Rather, they become imperishable divine possessions, and moths cannot corrupt nor thieves break through to steal them. If you say that our experiences are not so valuable that God would wish to possess them, I reply, "I do not think so meanly of God's creatures as to suppose that they are not worth his cherishing; to think so is to think meanly of God". Moreover, the imperishability of God seems so much more important and so much more defensible on rational grounds than the imperishability, in any other sense than the one indicated, of any of God's creatures, that it is doing the world a disservice to give the impression, as Orthodoxy has tended to do, that the options are, either an imperishable God and imperishable human creatures, or neither, so that nothing of value would be beyond destruction. In my view the temporal finitude of a human life is its essential structure and beauty; I am entirely content with it. But our achievements of value must not be undone by the passing time. The essential achievements are the harmonies of experiencing, and precisely these are what the divine cherishing preserves. These for me are the "many mansions in the Father's house". Reinhold Niebuhr once told me that he was not sure this Whiteheadian doctrine of the "immortality of the past in God" was a heresy from the Christian standpoint, though he preferred not to attempt any philosophical rationalization of Christian beliefs. I add that I honour the author of the sublime Book of Job for reconciling Job to providence without any reference to heavenly rewards. Life is its own reward. I wish no other.

Again, what does God do in or to the universe? Above all, he makes it possible, and in the proper sense creates it, as a universe. The many processes harmonize together sufficiently to make a coherent cosmos rather than an unthinkable chaos. The laws of nature sum up this coherence, and the laws are true "acts of God". In short they are laws and there is a Lawgiver. Unlike human laws, however, the cosmic or divine laws or regularities are not maintained by sanctions, threatened punishments for deviations. Punishments are our poor human substitutes for the ideal means of making laws effective. God *persuades* the creatures to accept the laws as patterns for their behaviour. He makes certain patterns attractive to them. As Aristotle hinted, inspired by Plato, God charms the creatures. If you like, this is irresistible grace. However, it does not guarantee ideal behaviour, or complete and universal harmony and happiness. The laws still allow creatures, not just human creatures but all creatures, some freedom or power of decision-making. Hence the statistical nature of laws as science now conceives them.

In my "process metaphysics" or "neoclassical philosophy" there could not be a strictly nonstatistical, precise, regularity in nature, even for the behaviour of inanimate things. In every singular actuality there is a decision among otherwise open possibilities, a decision whose exact preprogramming is a logical impossibility. Hence the coherence or orderliness of the world is not absolute, exclusive of all disorder, conflict or frustration. The basic solution of the problem of evil is here and nowhere else. Evil, including physical suffering, is not a divine contrivance, for no matter what purpose. Evils are not contrived, they simply happen, as creatures make decisions with inharmonious consequences. Most of these decisions with unfortunate outcomes are without evil intent. Evils are, in detail, accidents, but evils are bound to result here and there in a cosmos of partly free creatures. They are not punishments or divine instructions. They are unlucky accidents.

This view has been attacked as a confusion between freedom and chance. The attack is the confusion. Freedom is positive and chance is negative; but, like nearly everything positive, freedom has a negative aspect, it excludes preprogramming. Many great philosophers have seen this: Peirce, Bergson, Berdyaev, Whitehead, are among these. The positive in freedom is that it adds to the definiteness of reality, replaces an indeterminacy with a determinacy, and thereby enriches the divine life. Freedom is creation.

If evils are not divinely contrived but results of creaturely freedom, is not God, as the maker of free creatures, responsible for the results of freedom? This argument assumes that God has an option, freedom or no freedom. But process philosophy holds that freedom is the principle of all possible existence. To create freedom would be to create creativity itself, and this is nonsense. Divine creativity, or creaturely creativity, partly in act, partly in potency, is all that reality, actual or possible, can be. To be is to decide, to be an individual is to decide individually, to settle what all other individuals leave unsettled, even if God is among the other individuals. The poet Sydney Lanier expressed

this in his poem "Individuality". He says that the poet, not anyone else, man or God, makes the poem. "It is not true, it is not true" is his emphatic rejection of the idea that God decides everything, including our artistic creations. Lanier does not explicitly generalize the principle to apply to all creatures; but when he denies that an inanimate object, e.g. a cloud, is an individual ("there is no thee", he says to the cloud) he comes close to the point, which is that to be individual is to decide individually, and hence if we do not discern freedom in inanimate nature it can only be because we do not discern the individual constituents thereof. Process philosophy implies that for God to have free creatures is no more than for him to have creatures. To have a world without creaturely freedom is not an option, even for God.

Although all creatures have freedom, they do not all make conscious choices. Conscious choices, like conscious anything else, form a special case. An infant has feelings; does it have conscious feelings? What does "conscious" add here? We know in what sense adults have conscious feelings. They not only feel pain or pleasure, they think, happily or otherwise, about these feelings, they classify, explain, in countless ways verbalize about them. Not much of this can take place in an infant. In most of nature, whether or not there are feelings, thoughts seem absent or at a minimum, apart from the divine thought some of us see as embodied in the laws of nature. So if the nonhuman creatures, or infants, make decisions, these are made largely without thought and in this sense unconsciously. Peirce held that all feeling is "spontaneous", by which he meant that it was not causally determined, though of course it was causally conditioned. Creativity is quite compatible with every event having its necessary conditions; only the concept of "sufficient" condition requires qualification.

The qualification is not that some actual events lack and some have sufficient conditions but rather that no event in its full concreteness and individuality has such conditions. Determinism is at best an abstract outline of events.

Please dismiss from your minds the Stoic-Spinozistic-Hegelian idea of freedom as preprogrammed voluntariness. Freedom is the power to create definiteness, not to transmit it as already created in some remote past. I have, with the Socinians, with Jules Lequier, Varisco, Bergson, Peirce, William James, Whitehead, W.P. Montague, John Findlay, Paul Weiss, and many others, turned my back forever on the idea that only God creates in this sense. God is supremely creative, but all are creators; there are no mere creatures. Nor, for that matter, is God mere creator, for as enriched by the creatures he is in one aspect created.

Since all are creators there will be some confusion and conflict. "Too many cooks spoil the broth" fits even this case. God's persuasion, issuing directives to all creatures to keep their decisions within certain limits, is the explanation of how there can be a universe, in spite of the fact that every least creature has a role in deciding what the universe is to be. Multiple creativity explains the (partial) disorder, Eminent creativity explains how there can be anything but disorder, how it all can add up to a coherent, knowable cosmos. To me it is wonderful that it took two thousand years of speculation to make it possible for so simple and elementary a solution of the central cosmological problem to be clearly stated. Yet you will not find it so stated before Whitehead, or at least before Peirce. It is compatible with the Book of Job but is not stated in it. Nor is the explanation of evil merely in terms of human freedom a reasonable solution. One must free ourselves entirely of the notion of a deity whose creatures, any of them, are mere puppets. And for modern physics puppets are never merely that! There can be no such thing. Quantum "mechanics" is remarkably unmechanical.

Aside from the laws of nature as acts of God, are there any other divine acts? I see no way to prove that there are no others, but also no way to prove that there are. Evolutionary theory, for example, has found no clear need for special divine intervention to explain the history of life on this planet. Not that the neo-Darwinian account is so clear and exact that such intervention can be rigidly excluded. But at most the question is open.

It does not follow that there is in no sense room for "special providence". With Whitehead I affirm such providence. It concerns God's persuasion of each creature that it take its place in the cosmic order. It is superstition to talk deistically of God starting the universe with its laws and letting it "run itself". Laws are not entities that can be put into a universe and left to control events. A law is not an agent that does things. Law is only an aspect of what agents do. The divine persuasion of the world is a perpetually renewed act. And I conceive it as individualized for each creature. God persuades each atom as that atom, he persuades me as me, to take its or my place in the cosmic order. The place must be made attractive to the atom or to me here and now. So the ordering of the world is a conscious relation of God to each creature. In any case God's cherishing of each creature, by which it acquires its immortality, is individualized for each creature. It is conscious perception of that creature. Of course all this utterly transcends our capacity to imagine save in the vaguest and most indistinct fashion.

It is important to realize that for process philosophy, and for current physics as well, it is no explanation of orderly process that a changing thing has a certain "nature", put into the thing with its initial creation and governing its subsequent changes. The word *nature* here is merely a synonym for a specific order, and not its explanation. Creative freedom is the reality, and each moment it makes new decisions. In these decisions previous ones are indeed taken into account, for the past is necessary condition for the present, but since there are in the strict sense no sufficient conditions for what concretely happens, but always some departure from mere routine, there would be no limit to the extent to which individual decisions might mutually frustrate one another and prevent the cosmic becoming from illustrating any definite patterns by which it could be coherently thought or known. The Eminent creativity decides upon patterns of order relevant to the entire cosmos.

Since the laws of nature are divine creations they can be changed. And Whitehead, like Boutroux and Bergson, envisages a cosmic succession of natural laws. Each new set of laws defines a "cosmic epoch". The reason for God's changing the laws is analogous to that for the succession of styles in art. A (statistical) natural law is a theme of which each instance is a variation. No theme save one is worthy of an infinity of variations. (The exception is the divine essence as a theme, of which each divine decision is a variation.) Hence cosmic epochs are each finite in both time and space. The only true infinity is the divine process, beginningless and endless, God as always with some world or other. Origen believed in a beginningless and endless succession of creations; Whitehead adopts a view reminiscent of this ancient one.

God is not actually infinite in the classical sense of exhaustively realizing all possible values. The reason for this is logical; there are incompatible possible values. But God is infinite in potentiality, bound to transcend in turn each and every actual universe. His absolutely infinite potentiality to have worlds cannot be exhausted in any actual world or set of worlds. Even divine actuality cannot exhaust divine

potentiality. Given any actualization of value you please, further divine potentiality for actualization will remain. So process will never cease. The ultimacy of process has a theological ground. But though process will never cease, our cosmos may cease, as may the human species. Human history will have its final chapter, but divine creation as such can have no such *finis*.

Human history is a very small part of the history of our cosmic epoch, according to our present knowledge. Is there not in this fact an indication, additional to that furnished by other evidence, that the human creature is not the sole end of creation? The reasonable view of Deity is that it is the Eminent or Not-by-others-surpassable form of the interest which individuals take in other individuals and other kinds of individuals. This interest is more comprehensive in us than in other creatures; by analogy it follows that, since our species is the supreme image of God on this planet (and it is arguable that its members are bound to make this assumption even when they claim to avoid it), God must be interested in all creatures, not just in our kind of creature. He enjoys the spectacle of life in all its variety and symbiotic beauty. In this way all life contributes to the living One who alone can appreciate life's every nuance. He experiences our experiences and those of all creatures. His feelings are feelings of all feelings.

Does the foregoing mean that when we hate God hates? Rather, he feels our hatred, but without making it his own, just as he feels our feelings of ignorance without being ignorant. We do not ourselves have to hate in order to feel the hatred in our fellows, nor do we have to share all their ignorance in order to feel how their ignorances trouble them. God shares the emotional qualities of our lives without being committed to the beliefs that our limitations of awareness alone make possible. To believe something is to be prepared to act upon it. God acts upon his own beliefs, not ours. But this does not prevent him from being the one "to whom all hearts are open". He is no mere detached spectator of the "ocean of feelings" which is nature, but is the supreme synthesis of those feelings into super-feelings which are divine.

It follows that if sufferings were deliberately inflicted upon us by God he would be a masochist as well as a sadist. Sufferings are not inflicted, they simply happen. Only human beings deliberately torture. Alas, many governments are doing this right now! The lower animals do not do this and God does not. We must not excuse our species by supposing otherwise.

On this planet, or in this solar system, the human species sums up best the possibilities of life. It has the senses of the higher animals as completely as any species, and it has, so far as we know, the additional gift of elaborate reflective thinking to an extent not possible for the other species – granted that the whales and dolphins and some primates approach us more closely in this respect than we used to think, just how closely we do no yet know. (Probably they are somewhat like small children that can never grow up.) From this superiority it does not follow that the other animals have value for God only because they are valuable to us. Even we have some interest in these animals for their own sakes. We sympathize with their weal and woe. If God is the optimal form of the interest of life in life, all forms of life interest God, who alone can fully appreciate their harmonies and intensities of feeling. The fact, therefore, that as man multiplies he tends to diminish the variety of life on the planet is to be seen as tragic. As Berdyaev and Whitehead both say, the root of tragedy is not the conflict of good with evil, but of good with good. This is inherent in existence itself as the partly chance interrelations of creative individuals. It would occur in any possible world.

Since the multiplication of human beings threatens human life itself, the love of nature is reinforced by considerations of species loyalty. The notion that it is natural and good for people to have many children was useful enough during the long ages when prescientific hygiene made such fertility necessary to overcome the high death rate, and when much of the world was thinly settled. (Even then, in some small islands at least, overpopulation was a problem and was met by various means which are likely to shock us.) Now our "unnatural" low death rate requires an equally unnatural low average birth rate. Otherwise it is mere arithmetic that catastrophe lies ahead, and not very far ahead either. This is what the pollution crisis, the fuel shortage, the destruction of the world's forests, and erosion of the soil, and many other troubles or tendencies, imply.

The love of nature, though sadly undeveloped in many or most human beings, is still an essential ingredient in human life. And even those who feel little of this love should see that our imperialism towards the rest of nature has its dangers for our human safety. Polluted rivers and oceans may not yield the fish we are accustomed to eating. Without minimal understanding of and respect for natural things we shall not even make the most of them as instrumental to our survival. But nature is incomparably more than a mere means to human ends. All creaturely life, including our own, is means to the divine life, the sole absolute end. "The glory of God" is the whole of what matters.

It is an error to argue that if God derives benefit from the creatures then his love for them is selfish or the expression of need rather than generosity. Several oversights are combined in this way of thinking. To love is to take pleasure in the welfare of others, to allow them to make a difference to oneself. When theologians defined God so as to exclude such influence, they were saying that God does not love. We contribute to the divine life solely because God loves us. There is nothing he in any sense needs from creatures except their own and their fellows' happiness. Here we can use the Platonic analogy of the mind-body relation. As our physical pains come to us from injuries to our bodily members, our cells, and our sense of physical well-being from the health of those cells, so our joys and sorrow contribute to divine enjoyment and suffering. Why do we share the weal and woe of our cells? It is as if we loved them with a love that is truly innate. Is it selfish to want a healthy body rather than a sick one, flourishing rather than languishing cells? If not, and of course it is not, why is it selfish for God to wish health to the cells of his cosmic body? In this case the allegedly selfish concern embraces all the weal and woe that exists for anyone to care about. The all-knowing one cannot possibly bring about a good that he will not himself possess simply by knowing it. (Only deficient knowledge leaves something of value outside the knowledge.) Generosity in that sense is the virtue of beings imperfect in knowledge.

When theologians, following Aristotle (who here, as in some other ways, debased Plato), rejected the mind-body analogy they were left either with the dangerous political analogy of God as supreme benevolent tyrant (not benevolent enough to grant the creatures genuine, i.e. not causally determined, freedom) or with an empty abstraction, God as First Cause. A tragic mistake, not less tragic because we know what factors brought it about. Hume hinted at the need for the mind-body analogy, but Kant, who in some ways summed up much that has been wrong with modern philosophy, missed the point entirely, and turned God into a cosmic magistrate and policeman who sees to it that the good are happy in proportion as they are good – a proportionality to which the really good will not lay claim. Concerning the proper ways to relate religion and science, there

are, as always, opposite ways of missing the correct position. I have little patience with those apologists for religion who pretend to know the falsity of the evolutionary view that is generally accepted by biologists. Evolutionary theory is now highly technical, its understanding requiring considerable mathematical competence, for one thing; and I know some of its leading proponents too well as penetrating, sane, and honest minds to take such pretensions seriously. On the other hand I do not believe that theologians or philosophers should simply accept present scientific ideas as established once for all just as they stand. Science presumably has a future, and there will be changes in attitudes and ideas.

Science has always exhibited a reductionist tendency, the precise forms this takes varying with time. It is my firm belief that neither pure materialism nor a sheer dualism of mind and mere matter can make philosophical or religious sense. To conceive the supreme and universally efficacious reality as supreme mind or spirit has implications for our view of the lesser forms of reality, no matter how humble. If God is supreme mind or supermind and humanity is a more humble form of mind, other earthly creatures must be still humbler forms of mind in the ultimately generalized sense?

The basic principle here is this: we understand what is not ourselves by analogy with what we know ourselves to be. The analogy may be upward, towards more exalted and universally efficacious forms of mind, or downward, towards less exalted and less universally efficacious forms. The supposition that there are forms of reality that are not forms of mind or experience in any sense or degree whatever implies that there is a second way of understanding, totally without use of the analogy in question. I cannot discover what this second way could be. In this I am with multitudes of philosophers of all ages and countries.

If this view is criticized as anthropomorphic, my reply takes several forms. (1) All human thought is – human and expresses our mode of existence, whether we admit this or not. As Goethe wittily and wisely said, "Man never knows how anthropomorphic he is". The difference between vicious and reasonable forms of anthropomorphic, that is, human, thought is in the scope of the analogy posited and the care with which it is qualified. To speak of a dog as having feelings is not necessarily to suppose these feelings are duplicates of the pains and pleasures, hopes and fears, of human adults. Indeed the feelings of infants (still more, of human foetuses) must be decidedly different from those experienced in later life. And those who have spoken of "divine love" certainly implied some contrast in principle between that and any human emotion or attitude.

(2) Even physicists imply an analogy between patterns of human thought and patterns found in nature. What else can they do but imply this? But of course the analogy means no simple and complete duplication of the human by the non-human. What physicists do not at present officially do is to posit any analogy between human feelings or perceptions and the careers of molecules, atoms, or particles. But nothing in physics unambiguously forbids such a positing. It is an error to read negative answers into scientific avoidance of certain questions. Physics discusses behaviour, not feeling or perception (other than human). What is not discussed is not denied either. Perception, behaviouristically regarded, is differential response to changes in the environment. In all nature there is such response, for what else is causality? Francis Bacon long ago suggested on this basis that all things in a sense perceive. Atoms, as Newton conceived them, could not very plausibly be supposed to respond psychically to stimuli, because their responses were thought totally lacking in spontaneity or freedom, but we now know that such atoms were a myth or at best could not be known to exist; so the case for Bacon's statement is stronger now than when he made it. It is no accident that, before Whitehead, Bacon's remark was, so far as I know, neglected as of little or no relevance – unless possibly Leibniz was influenced by it in his psychicalistic monadology.

(3) I hold that no problem of science, philosophy, or religion is illuminated by the denial of psychical life to inanimate nature. It is not yet clear what physics could gain by admitting such life; what is already clear is that it has nothing to gain by denying it. And some of the best physicists of recent times have affirmed it, for example, Schroedinger.

(4) Has philosophy anything to gain by denying the pervasiveness of the psychical in nature? I have yet to find a well-considered affirmative answer to this question. Of course physical reality, "matter", exists all around us and in us. But to add the negation "mere" or "mindless" to the known facts adds nothing to our knowledge. How can an atom inform us that it is insentient? It used to be thought that matter was inert, merely passive; and this negative trait was explained by the absence of mind, that essentially active principle. Traditional dualism here explained a non-existent fact. Only by its activity is mind known to us at all. Every deduction that really follows from the idea of mere matter has been rejected by physics. One by one, as Whitehead pointed out a half century ago, these negations, e.g. inert, internally immutable, etc. have dropped out of science. They linger in some dead-waters of philosophy and religion, those final retreats of lost causes.

(5) Physicists are now rather well agreed that there is no absolute distinction between living and non-living. Consider ethology, the general science of behaviour. Has it any good reason to declare an absolute lower boundary to the applicability of its methods? Microorganisms have long been declared subject to psychological interpretation. What about plant cells? They resemble entire animals in their ability for integral response to what may reasonably be regarded as stimuli. Divisions of labour among branches of sciences are pragmatic and subject to change; they do not necessarily reflect absolute distinctions in nature. I hold that in time generalized psychical ethology will include physics as its most general branch.

(6) Since religion rests upon a form of anthropomorphic analogy, it is illogical to discard the general principle of this analogy when dealing with the lower levels of nature. Leibniz and (less clearly) Berkeley saw this two centuries ago. Why should God create mere insentient matter (whatever – who knows? – that might positively be) when sufficiently simple and primitive forms of mind could fulfil any conceivable divine purpose? Mere matter would be something with no intrinsic life or value, which, however, could serve as means for entities with such life and value. But we see in innumerable ways that being a means to life is compatible with being alive. There is no logical need for means that are merely that. The social nature of life implies that the same entity can be means and end. The bacteria that help us digest food are living creatures, and nothing tells us that they do not enjoy their lives. Moreover, how better can we explain the necessity for there to be human nerve cells if there are to be human feelings than by supposing that our feelings are higher level syntheses of the more primitive feelings in those cells? "From feeling feeling can come" is, to put it mildly, not inferior in intelligibility to "from the total absence of feeling feeling can come". And as our feelings synthesize lower level feelings, so the highest level feelings of Deity synthesize all other feelings whatever.

Never before has there been a religious cosmology with so straightforward a logic. If the divine relation to us is best regarded as the Eminent form of participation of life in other life, that is of sympathy or love, why condemn Deity to split himself into two entirely alien functions; participation in lesser life and awareness of the absolutely lifeless? It would then be false that God *is* love in its Eminent form, for he would be a mixture of love and something entirely different, something I see no way positively to conceive, a mere neutral recording, as by a camera, forgetting its molecular parts, taking a picture. Nothing of the kind seems in order in conceiving Deity.

The psychicalist rejection of mere insentient matter is often taken to imply such absurdities as that a table, a mountain, or a tree feels, perceives, perhaps thinks. None of these assertions follows. A crowd of people does not consist of insentient matter, yet it is metaphor not literal truth, that the crowd feels, perceives, or thinks. It is the fallacy of division to apply "S is P (or not-P)" to the members of a group or the constituents of a whole simply because it applies to the whole. There is no logical rule by which to infer "molecules do not feel" from "tables do not feel", nor even "plant cells do not feel" from "trees do not feel".

The principle here is that *only what acts as one feels as one.* Tables are not active singulars, and most botanists would, I think, grant that even trees are not such singulars. But cells and molecules are agents whose activities can adequately account for any "actions" we wish to impute to inanimate objects or multicellular plants. Multicellular animals are another matter; their nervous systems explain the difference, and our direct experience reveals our own self-activity which, by properly qualified analogy, we have every right to attribute to other animals, as well as to single cells. Trees "bend" towards the light, but a legitimate reductionism interprets this as shorthand for the way different cells, some in light, some in shadow, respond to these differences in stimuli.

What non-question-begging criterion could tell us that certain things were totally devoid of feeling, not only as wholes but in their constituents also? The absence of a nervous system is often made the criterion. But a nervous system is a group of cells that enables a many-cells creature to have, on a more complex level, the unity of action that single-celled creatures can have without a nervous system, just as a muscle is a group of cells that enables the metazoon animal to do what a paramoecium does without muscles. The only criterion here that does not grossly beg the question is that of Leibniz: active singularity. The importance of Leibniz is often missed because of other features in his system that are now of little more than antiquarian interest and quite out of harmony with cultural changes since the end of the 17th century when Leibniz's system took its final form.

The fact that some members of nearly every religious denomination in the United States calling itself Christian, including the Roman Catholic Church, as well as some religious Jews, have found encouragement and inspiration in my work both pleases and yet troubles me. The reason for the latter feeling can be variously expressed. A scientific acquaintance once quoted Heine to me as saying, "All the religions stink". Probably any person knowledgeable in the history of religions will have no difficulty in understanding how Heine could say this. Is there any folly, indeed any wickedness, which no persons claiming sacred or divine authority have indulged in or connived at? Whitehead, thinking of the religious wars and persecutions of the ages, puts the startling query, "Will religion ever cease to be a synonym for hatred?". A shocked friend of mine, after nine months of study in South East Asia, said of the diverse religious groups there, "The best they can do is to ignore each other". Think of the support given on religious authority to slavery, racism, male chauvinism, and much else that I regard as at best unintelligent and at worst wicked. Think of the sabotaging of science, that supreme achievement of humanity, or of the stubborn refusal to readjust traditional ideas and moral codes, appropriate enough under conditions of primitive science, pure and applied, but inappropriate and harmful under conditions of advanced science and technology.

I will give a specific example. A theologian, on some issues an enlightened thinker, trying hard to think straight about abortion, in my judgement failed to reach a reasonable position. His doctrine is that the fertilized egg cell is already a human individual and therefore must under no, or almost no, circumstances be killed. With this to my mind irrational affirmation he, like countless other males (shamefully joined by some females) undertakes to tell women their duties to God and their species. The following statements seem amply supported by science.

(1) A fertilized egg is a single cell, while a human being in the full sense is an organized whole of many billions of cells, above all including a nervous system of a unique degree of complexity (according to some perhaps rivalled by the nervous systems of whales and dolphins). Thus a fertilized egg is only potentially human in the full value sense, and is separated from that value by a qualitative difference vaster than that between an adult human person and even the lower vertebrates.

(2) The fertilized egg can develop into a fully human being only by means of intense protracted effort and sacrifice by at least one person. It is not though it were a seed sprouting in a forest, which needs only to be let alone to become, with luck, a mature tree. Anything but that is the situation. Margaret Sanger, out of her deep meditation on these matters, well said, "The first right of a child is to be wanted". And a primary right of a woman is to have only wanted offspring. I lose patience with men or women who will not see this.

(3) The fertilized egg has indeed, with one qualification, the chemical individuality (the DNA or genetic code) of a potential person. The qualification is that with identical twins not even this is true, since such twins have the same code yet are two individuals. But what crass materialism to equate the chemical individuality of a person with the person! I say this not because the DNA is physical, but because the proximate physical basis of personality is not chemical but neural. Identical twins have the same chemistry, but it by no means follows and is certainly quite false that their nervous systems have the same structure. The DNA influences the development of this structure but so do several other sorts of factors. These are (a) stimuli furnished by the uterine or extrauterine environment and non-neural parts of the body, and (b) various feelings and experiences as the foetus, infant, or child responds to the stimuli. With the neuro-physiologist Sperry I hold an interactionist theory of the mind-body relation. I also believe in the genuine, slowly increasing freedom of the psyche. As the poet Spenser put it, "For the body from the soul its form doth take/for soul is form and doth the body make".

(4) Of the several hundred thousand eggs in each woman and the billions of spermatozoa in each man, all but a tiny fraction will die before growing into anything further. Yet each egg and each sperm is a living animal. And it is "human", if that means not canine or bovine, and that it comes from and could develop into the fully human. It is genuinely alive (one grows weary of the vague "when does human life begin?"). True, these single-celled creatures are not "viable". But why is that such an all-deciding consideration? Again one sees the seed in the forest fallacy. Human beings

are made by human adults, mostly female, working before and after birth; they do not just grow.

(5) The old mistake that the womb is merely container for soil in which the male form-giving seed grows, made such a point of by Aristotle and Aquinas, is not in my opinion a wholly innocent piece of ignorance. For the ignorance was absolute, and by men claiming to reflect ought to have been acknowledged as such. No scintilla of evidence supported the denial of female form-giving elements (the genes or units of DNA in the female egg). The male seed was external and visible, the female was hidden. What evidence there was implied female form determinants since children manifestly inherit physical traits from mothers as well as fathers. But, alas, the myth of female deficiency fitted only too well the male arrogance that pervades all history.

When in 1848 a group of American women met and drew up a list of reasonably formulated rights of women, who responded positively? One would like to see research on this matter. We do know that John Stuart Mill gave his resoundingly affirmative reply in *The Subjection of Women,* and that (less widely noticed) Emerson wrote in his diary, "Of course they should have these things. It is very cheap to laugh at them." How this male cheapness disfigures the history of feminism! But Emerson always took the noble side of moral issues.

With primitive technology and consequent high death rates and need for high birth rates, especially in thinly settled parts of the world, also with premature death for most women, it was natural, human weakness being as it is, to look upon women as male adjuncts of somewhat sub-human capacity. Technology has at last removed the excuses for such an attitude. Religions should reform themselves to fit the new situation. How far will they lead and how far merely belatedly follow?

Aquinas, aping Aristotle, said, "What makes a woman a woman is her inability to produce semen". It would be as true to say, "What makes a man a man is his inability to produce egg cells", and much more to the point to say, "What makes him a man is his inability to grow fertilized egg cells in his own body and nourish them after birth from that body". But no, femaleness was viewed as the absence of something. Please do not ask me to believe that this was an impartial – not to mention divinely inspired – view of the sex difference I agree with Clare Boothe Luce that the myth that woman was made from Adam is an attempt to take from woman her plainest prerogative, that of maternity. Adam, forsooth, was Eve's mother.

The task of overcoming one-sidedly male views of life is subtle. Crude rebellion may be counter-productive. For example, women who demand the "same freedom" in sexual matters as that to which many men lay claim may be falling into a masculine trap. It is primarily men who clamour for the overcoming of sexual jealousy. And on physiological grounds parenthood and the stability of a sexual relationship are bound to mean less for most men than for most women, who may have more to lose from aping men in this respect than they realize. As one who has been married to the same woman for almost fifty years with increasing rather than decreasing satisfaction with the arrangement, I am not among those celebrating the "passing of the monogamous family". The effective reforms may need to be more subtle. For example, there is need to re-evaluate the way male obstetricians, with some admirable exceptions, have almost wholly subordinated the vital mother-infant relations during and after birth to merely physical matters of hygiene and easing of pain, besides over-encouraging bottle feeding. The present high ratio of male to female doctors in my country is no matter for national pride.

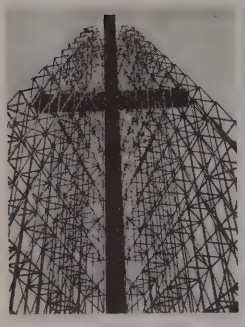
Above all, the point is not that women must be treated exactly as men are, but that individuals are to be treated as individuals. If pregnant women are a special class, it is because they are pregnant not because they are women and if women of child-bearing age are to be treated in a certain way, it is because of the age not because of the sex alone. Women too old for this function are in that respect like men of no matter what age, and women with rare cultural talent or genius are to that extent like men similarly gifted. We must try to overcome stereotype by which individuals are cheated out of opportunities appropriate to their individual natures and situations. It is only most, or many, women, who should bear children, and even they for a diminishing portion of their lives as longevity increases. Childless couples may need to be congratulated rather than scolded; for they may be doing the world a favour by not doing what they lack the will, and perhaps the capacity, to perform well. Potential children have a "right" to remain merely that, if the alternative is to be born unwanted.

From my studies in ornithology I derive the following parable. Taking approximately 9000 species of birds we find the following: of the functions or activities that are physiologically possible for both sexes, as nest-building is and egg-laying is not, some are performed by the males in most but not in all species, thus singing or plumage display, and others are performed by females in most but not in all species. No function physically possible for both sexes is reserved exclusively or even primarily for one sex in all species. In some species the male does much more to care for the young than the female, who may do the singing and visual displaying. I put this broad fact about birds together with a basic fact about our species: it is incomparably more highly individuated than any other. A psychologist has even said, the possible differences between one human being and another exceed the differences between one non-human individual animal and another of no matter how diverse a species. For by comparison with us all other animals are almost alike in their inability to use anything closely like a human language. And think of the differences among languages and the differences between linguistically hopeless human idiots and Shakespeare, or Jesus. In combination my two facts imply for me that as there is nothing physically possible for both sexes that in all species of birds is reserved exclusively for one sex, so in the uniquely individuated species, humanity, there should be nothing physically possible for women that only men do and nothing physically possible for men that only women do. Also, if the average number of children per couple required for optimal population size is close to two this is no reason why many couples should not have one or no children and some have six or seven. The desirable average is a very different thing from the desirable number in the particular case. Individuals we are and ought to be.

I am deeply troubled by the multitudes of theologians who have thought to exalt Deity by denying to him the privilege of having creatures with genuine power of creative freedom, and who have spoken of God predestining creatures to bad actions or attitudes for which they are to be punished by unending torment or to good actions for which they are to be rewarded by unending bliss – a view termed by Berdyaev "a piece of sadism" and "the most disgusting morality ever conceived". I think it well that it was not left to unbelievers to deliver this blunt judgement. It was also Berdyaev who said that atheism is the not surprising result of the extraordinary procedures of classical theology that made God the real decider of the evils for which persons are to be punished. In the words of Nietzsche, "human, all too human".

Confirming Nietzsche's view that such blemishes are to be attributed to our human condition is the fact that the quasi-religions of communism and fascism have duplicated, to understate the case, many of the evils of the older religions with some new angles and villainies. Even the attempt to suppress scientific inquiry (the Lysenko case) has been exhibited.

On the hopeful side is the consideration that religious leaders have begun rather generally to realize the need and the possibility of purifying religion from the mistakes of which I have given a crude sketch in preceding paragraphs. One must hope that the future of religion will in some respects at least be better than its past. There was a time when doctors and hospitals were doing child-bearing women much more physical harm than good (puerperal fever); that time is now past. There has been a time when theologians were making things easy for atheists; that time too seems to be passing. It is not impossible for human beings to rise to the conception of Eminent creative love cherishing creatures whose very essence is their being lesser non-eminent forms of such love, with all its dangers and all its opportunities.



AN EASTERN ORTHODOX PERSPECTIVE OF NATURE, MAN AND GOD

Paulos Gregorios

Nature is a concept of Indo-hellenic origin which the authentic Christian tradition finds problematic. If it refers to "all things" (ta panta) constituting a system, a unity, with a particular structure and order, then man is essentially a part of that system; if it is interpreted in a non-inclusive way, it would have to be qualified as "sub-human nature", or "non-human nature" or "nature minus humankind".

If the assumption is that nature is something which exists by itself (naturally), as distinct from human culture, the authentic Christian tradition must again object. The creation is not self-generating or non-contingent. It does not have *autousia* or self-existence. Only the Creator has such *autousia.*

To put it rather provocatively, nature does not exist; only the creation exists. Nature is a false concept, bound to mislead. The sooner we abandon it, the less exposed we will be to erroneous thinking.

The creation – *ktisis* – includes humanity. To talk of the creation minus man is absurd. We do not speak of man's relation to the creation, as if they were two separate realities. The most we can do is to speak of man's place in creation, and his relation to the rest of it in terms of that place.

The creation, in Eastern Orthodox thinking, is a dynamic entity, not a work that was completed in six days, as the Genesis account of it is sometimes interpreted. It is a process for which the *arché* or source is the creative *energeia* of God. Its destiny or *telos* is also given in the creative act of the divine *energeia.* That same *energeia* provides the dynamic necessary for it to move from *arché* to *telos,* from *inception* to *perfection,* from *beginning* to *fulfilment.* Thus the creation has no self-existence. The *energeia* of God is its source, goal and dynamic.

How is creation to be understood, and what is the role of man in it? In answering these two questions, this paper resorts to a certain amount of necessary speculation, based on the Patristic heritage which shaped the classical Christian tradition. It relies heavily on Gregory of Nyssa (ca. 331-389 A.D.), the only philosophical theologian of the undivided Christian Church who has dealt with these themes in any profound way and who is acceptable to the authentic tradition (Origen is not accepted; Augustine of Hippo and Maximus the Confessor are rejected by my particular tradition).

1. The Sources, Norms and Limits of Christian Understanding – Some Methodological Considerations

a) Epinoia or the Power of Conception and Creativity

Human beings are endowed with the capacity to conceptualize and to create. Gregory of Nyssa calls this capacity *epinoia.* Sense-impressions are the raw material through which the human mind informs itself. The nature of the mind enables, structures and limits the information intake. It is the faculty of *epinoia* which makes understanding possible, which enables man to imagine and to create the marvels of music and the arts, of architecture and technology. Man's relation to his environment is shaped by this ability to understand and to engineer.

Theoretical understanding, however, cannot be divorced from action. The head and the hands have to be coordinated, and language serves that coordination. Gregory of Nyssa regards the three elements – head, tongue, and hands – understanding, language and action – as essential to man's proper relationship to his environment. *Epinoia,* or the power of conception and creativity, has to do with all three, as well as with their co-ordination.

b) Evil, Sin and Error

The *epinoia,* however, is not free from error. It is capable of creating chimaeras, of conceiving things which do not and cannot exist. The root of the error is in sin. Because of sin man is no longer in the state in which he was created. By a primordial act of evil, the human mind became incapable of knowing the truth. The possibility of error lurks behind every conception of truth. The world as we experience it is also shaped by this admixture of error in the *epinoia,* itself caused by the admixture of evil in the human being which was created as good, but is now capable of evil as well as good.

True understanding therefore demands release from this admixture of evil. Only as the human person is progressively liberated from the evil does his *epinoia* begin to function as it should. All three – understanding, language and action – are affected by the admixture of evil. Only through the transformation of his being can the human person arrive at error-free understanding, language and

action. This transformation is ultimately effected through the process of death and resurrection, but that process can begin already here, through participation in the death and resurrection of Christ, through life in the Community of the Spirit.

c) Life in the Community of the Spirit – Participation in the Living Tradition of Christ

The community of the Church has its own understanding, language and action, which always transcends the rational. No final conceptual apprehension of reality is available to the community or to any of its participants. The best mode of apprehension and expression is the eucharistic act. All dualities are transcended in this act of union between the Creator and the creation, through participation in Jesus Christ the incarnate. Time and space are also transcended in this act, where eternity breaks into time and transforms it; where union is achieved with "all the saints" in space and time; where matter is the bearer of the spirit, the Bread of Life; where God, man and the creation are united in one act of mutual self-giving; where the creation is offered up to God in self-offering and where God offers himself to the creation through the body and the blood; where the world is transfigured to bear witness to the glory of God; where the subject-object dichotomy is overcome in the act where the offering, the offerer and the one to whom the offering is made are united in love; where reason and the language of reason merge into the act of love; where memory and hope bring the past and the future together into the single moment of present eternity...

This kind of theological language baffles and at times infuriates the scientific observer, for it refuses to be bound by the canons of ordinary speech. But both rite and symbol transcend ordinary speech. What follows is an attempt to translate into prose some insights about the nature of the creation characteristic of this strange community of the Spirit.

2. The Creation – Contingent, Extended, Dynamic

a) The Nature of Matter

Gregory of Nyssa made it very clear that matter as such is an abstraction which we never encounter. What we see is matter with qualities, the elements with their atomic structure. Gregory knew nothing of the sub-atomic world of particles; what he says about matter as abstraction applies at the macro-level of atomic molecular matter.

But Gregory never made the mistake of saying that the universe is composed of matter in motion. Nor did he regard matter as an inert vehicle for its qualities. In fact, he insisted that minus qualities matter is nothing, that it has no existence apart from the qualities. Different forms of matter are but different confluences of qualities.

He went one step further insisting that matter is nothing but energy – God's creative energy, moving dynamically from one form to another. The basis of matter is energy, the coming together of God's will that it exist and God's word which brings it into existence. Thus God's will-and-word, which is the *energeia* of God, is the basis of matter. Matter is the manifestation of God's *energeia,* contingent upon his will-and-word, dynamic and changing.

Today with our knowledge of the sub-atomic world, we can go further. We can confirm Gregory's insight that the sub-atomic particles which constitute matter are a dynamic network of energy events continuously changing, forming, dissolving, re-forming. There are no "basic building-blocks", no solid entities occupying an absolute space. Energy and mass are interchangeable in an orderly way ($E = Mc^2$). We cannot explain "nature" in terms of "elementary particles" and their primary qualities. The mechanistic picture of the universe popularized by 17th century science belongs to the museum of antiquity. Matter-in-motion is no longer an adequate or tenable explanation of the nature of the universe.

b) The Unity and Inter-relatedness of the Universe

Most of our rational thought relies too heavily on the division of the universe into classes and species, into epochs and ages, into centuries and events, into separate objects and separate happenings. We find this division helpful and necessary. But usefulness is no guarantee of truth; the pragmatic criterion so central to modern science is at best a questionable test of truth.

What we have, more clearly in the sub-atomic world and less obviously in the macro world, is an interaction between the observing system and the observed system – not absolute knowledge of an independent object. In relation to the sub-atomic world, however, the observing system (that is ourselves with our experimental apparatus) is always understood in terms of classical physics, while the observed system has to be understood at the level of quantum and relativity theories which do not fit into classical physics. It is only in terms of the latter that the observer-observed dichotomy can be maintained. At the sub-atomic level, the observed and the observer are united in one interlocking system.

In an area where his technical knowledge is severely limited, the theologian must resort to the authority of the scientist. A recent article by David Bohm puts it this way:

> *"One is led to a new notion of unbroken wholeness which denies the classical idea of analyzability of the world into separately and independently existing parts... We have reserved the usual classical notion that the independent 'elementary parts' of the world are the fundamental reality, and that the various systems are merely particular contingent forms and arrangements of these parts. Rather, we say that inseparable quantum inter-connectedness of the whole universe is the fundamental reality, and that relatively independently behaving parts are merely particular and contingent forms within this whole."*[1]

What we regard as solid, stable, material objects with their apparently objective existence, dissolve, at the sub-atomic level, into waves of probabilities, which are primarily patterns of inter-connections. We cannot observe nature as an object. If Heisenberg is right, "what we observe is not nature itself, but nature exposed to our method of questioning".[2] When our experimental arrangement is modified, the data yielded are also different. The observer thus becomes participator in the reality which he is measuring, and he can never know how that reality appears apart from his own participation, or the participation of someone else.

The idea of an "objective world" independent of man has thus to be abandoned; there are no two realities called "man" and "nature" which can somehow be separately observed.

Nor can we any longer hold space and time as separate realities. Space-time, matter-energy, particle-wave, rest-motion – all these dualisms of classical physics also disintegrate at the sub-atomic level. Judging from literature on the subject, even the concepts of existence and non-existence seem to be problematic. Is Robert Oppenheimer right when he says:

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1 D. Bohm and B. Hiley, "On the Intuitive Understanding of Non-locality as Implied by Quantum Theory", in *Foundations of Physics*, Vol. 5 (1975).

2 Werner Heisenberg, *Physics and Philosophy* (London, 1963), p. 57.

"If we ask for instance, whether the position of the electron remains the same, we must say 'no'; if we ask whether the electron's position changes with time, we must say 'no'; if we ask whether the electron is at rest, we must say 'no'; if we ask whether it is in motion, we must say 'no'."[3]

If he is right, then it is no longer right to say that everything is in perpetual change. Polar opposites like permanence and change, existence and non-existence, seem to co-exist, and even the most dialectical ordinary language fails to do justice to the complex inter-locking web that is our universe. The time-honoured principles of non-contradiction and the excluded middle fade into insignificance as being of use in only a very limited area of discourse.

What emerges is one universe, man inextricably interlocked within that system. It is this notion of the creation as one inter-related web, of space and time as merely aspects of it and not any kind of medium or vessel in which realities exist, which is affirmed by the authentic Christian tradition (which some wrongly insist on calling the Eastern Orthodox tradition). The whole creation is a single unit, with space and time as merely cognates within it. According to this authentic tradition, it is absurd to ask questions about "the time before creation", for time begins with creation. Since the beginning of creation is also the beginning of time, there is no before that beginning.

Modern physics puts a couple of questions to the classical Christian tradition. These relate to change and extension. Gregory of Nyssa would insist, for example, that change and extension are the essential characteristics of the created order, that everything in space-time is extended or distended, and that everything is continuously changing. The notions of change and extension can no longer be held in this absolute manner in the sub-atomic world, though even the micro-entities called particle-waves have their own probabilities of location and momentum. This means simply that the notions of extension (*diastēma*) and change (*tropē*) in the classical Christian understanding of creation have to be suitably modified in order to accommodate the new insights of nuclear physics (relativity and quantum theories).

But the unity and inter-relatedness of the cosmos as affirmed in the classical Christian tradition is confirmed by the revolutionary new hypotheses of relativity and quantum physics. Man is inseparable from that unity. There is no nature as "creation minus man". We will deal with the place of man in creation in the next section.

c) The Nature of Time

While it is true that modern physics does not permit the notion of time as a separate entity in which events occur, but sees it merely as a dimension of reality, the fact remains that we human beings experience time in a peculiar way. This peculiar way is only tangentially affected by the relativity understanding of time as one dimension of a four-dimensional reality.

To put it very bluntly, we experience time as death, and not only in the sense that every moment of time brings death closer, that every tick of the clock is the footfall of approaching death. We experience time as death in another way. Every moment is born dead, for by the time we are able to say "now", the "now" has gone and become the "then" of the past. The moment called the present is, from our perspective, a fleeting point of intersection between two streams, the stream of the future passing over into that of the past. We can hold on to the past by "memory" and the future by "hope", as Gregory of Nyssa has said. But there is no way to hold on to the present. It fleets. As Augustine said, it sweeps us away and offers us no foothold to save ourselves from its flow.

Time is death for matter, too. If Carnot's Second Law of Thermodynamics still holds, then everything – the whole cosmos – is in the process of giving off energy and moving towards the stable equilibrium called death. "When a closed system containing a large number of molecules is left to itself, it assumes a state of maximum entropy: that is, it becomes progressively less ordered."

But life defies death, at least for a while. It creates ever more ordered systems, culminating in the evolution of the human brain, the most centred and complex system of organization of molecules that we know. It has been achieved through death and reproduction, through the process of a bio-cultural evolution that has been going on for at least 10,000 years of known cultural history.

Time is the arena where this struggle between death and life goes on continuously. Death disintegrates, life organizes. But life here, in our time, is always ultimately subject to death.

The Christian understanding of creation insists that this state of affairs is not final, that death came late into the cosmos, on the trail of that other enemy, sin. The present creation, or the creation as we presently experience it, subject to time-as-death, good-being always mixed with evil-non-being which drags it into the jaws of death, is to be liberated from both evil and death. This is a basic affirmation of the authentic Christian tradition. "Nature", red in tooth and claw, is not the last word. Sin is not the last word. Neither is death, nor Carnot's Second Law.

Life has triumphed over death, good over evil, being over non-being, in the death and resurrection of Jesus Christ. Therefore we affirm our hope in a new heaven and a new earth, where time itself is transformed into an aeon where there is neither death, nor, consequently, birth or marriage. But we acknowledge that as Christians we do not know how this will come about. The nature of creation as we now experience it is intimately bound up with our experience of death, but in our Christian understanding of creation, we do not take the "given" as somehow final. We do not settle into this deathbound sin-infested "natural order" as if it were the final reality. Nor can we regard knowledge, both theoretical and operational, of that present natural order as somehow the noblest of pursuits. Science and technology, which relate primarily to the knowledge of this decaying order of the present world, have their value in terms of making even this sin-infested world show forth the glory of God. But our hope negates this world which science studies, for we wait for a new heaven and a new earth where righteousness dwells, from which evil and death have been banished.

Not that the new heaven and the new earth are totally discontinuous with the present ones. Whatever meaning the present world has comes from that element of continuity with the coming world. Here we Christians differ from the Hindu Vedantin who denies any significance whatsoever to the present time-world. For us, its significance derives from the significance it will have in the new.

3. Man's Place in the Universe

This transcendent value of the present universe in terms of its relation to the coming one is a value which man is responsible for maintaining. Where that value is denied, as it was in the post-17th century atmosphere of secularisation, what results is a lack of respect for the creation. As Richard Schlegel put it:

3 J.R. Oppenheimer, *Science and the Common Understanding* (London: Oxford University Press, 1954), pp. 42-43.

"With no transcendent value postulated for nature, men were free to act on a philosophy of exploitation of the apparent great machine within which they lived. The same cosmology that allowed this license also gave, thanks to the validity of the Newtonian physics, a powerful weapon for constructing devices for the control of nature. Further, although man was of the world, he also stood apart from the scheme; for his intellectual and spiritual life were not to be related to the inanimate mechanisms of the natural world generally... Man's own welfare, therefore, as conceived in the light of his wants and powers, could in good conscience be furthered by any desired use of nature. It was an ultimate sadness that man was a puny and probably transitory phenomenon, without meaning in the great surrounding universe; but, also, he could display his ascendancy on earth, and, with a bit of good fortune, perhaps enjoy at least the major part of this life."[4]

What was necessary for the development of modern science was not so much the Christian matrix as the denial of it in post-17th century secularization in Europe. It was only be denying the transcendent significance of the present universe, and by isolating himself from it, so that value attached only to himself and his desire, that man was able to brace himself for the thoughtless exploration and exploitation of that universe. Man's making the universe an object was the consequence of a double transformation in the European mind – the denial of any transcendent significance to the universe, thereby making himself the subject and the universe the object.

The authentic Christian tradition calls in question both attitudes. The universe, though subject to death, has relation to the new heaven and the new earth, and so has transcendent significance; man is an integral part of that universe, and cannot stand outside of it, making himself the subject and it the object. The universe is not an object, nor is it made up of particular and independent objects. Man is not merely a resident in the universe, surrounded by different objects which he is free to manipulate. He is an inextricable part of that universe, and has emerged from within it.

The Christian tradition holds to three fundamental lines of thought about man's place in the universe:

a) *The Concept of Adam.* Adam means that which came out of *Adama,* the earth. His body has the same components as the earth. In fact, all living beings have bodies composed of the same elements as found in the earth. Man shares this aspect of his being with animals, plants and inorganic matter. "The first man is of the earth – earthy", as St. Paul put it.

b) *Man as the Crown of Creation.* The Tradition accepted an elementary form of the doctrine of evolution thirteen centuries before Charles Darwin. Gregory of Nyssa in the 4th century held the view that the same force of creation, operating in inorganic matter, shaped the plant world or vegetative sphere of life, the animal world or the bio-sphere, and the human world. He went further to say that the human body incorporates all the lower worlds – the animal and the vegetative elements exist and operate in the human. While Gregory rejected the man-as-microcosm idea, he held that man in a sense recapitulates and represents the whole universe; that in man the cosmos consciously responds to the Creator.[5]

c) *Man as Co-creator with God.* Man, as part of creation, is not an object for the cosmic forces to mould at their will. He is free. This means that he is not a passive subject, acted upon by the universe, but is capable of understanding and acting upon the universe. This is what the Tradition means when it speaks about *apatheia* as freedom. *Patheia* or passion is, paradoxically, passive. It means being acted upon and carried away by forces. *Apatheia* is active. It is not *apathy,* but a heroic refusal to be passive. If God is Creator, and man is made in his image, has man also to be in some sense a creator? He expresses this creativity by shaping himself, his society and his environment. This is his freedom – limited, but real. Science and technology can be instruments in the exercise of this freedom – freedom which ensues in creating of the good, the struggling against evil, overcoming the enslaving passions, responding in eucharistic thanksgiving to the Creator.

Any understanding of "nature" must then take into account these three elements:

a) man's participation in "nature" as integral to it;

b) man's representation of "nature" as its priest, so to speak; and

c) man's transformation of "nature" to conform it to the good.

4. God and the Universe

The relation between God and the universe cannot be grasped conceptually as long as one of the two terms – God – eludes the conceptual grasp. The tradition insists, however, that God is neither "beyond the universe", nor "contained in it". Not contained, for that which is contained would be finite; not beyond, for then there would be a boundary between God and the universe which would make both God and universe finite since bounded.

Gregory of Nyssa holds the following principles regarding the God-universe relation.

a) The universe subsists on and participates in God's *energeia,* but its "is-ness" is not of the same order as God's "is-ness", and therefore the relationship cannot be defined in terms of any relationship we know – which is always the relationship of two entities with our kind of being.

b) From our side, there is a *diastema* or gap between the universe and God, but from God's side there is none. The gap is experienced by us in many ways. One of these is that the rational understanding can travel through the sequential chain of the inter-connected cosmos, but never to the "is-ness" of the One on whom it is contingent. Rational knowledge does not get outside the created universe.

c) The question about God's existence is meaningless, since every created "is-ness" is contingent upon the uncreated "is-ness" of God. Nothing is, except in contingent relation to God's "is-ness".

d) Even the question whether God and the world are two realities is pointless. This does not mean that God is the same as the universe. But it does mean that God is not "outside" or "beyond" the universe, which would logically mean that the universe is outside God, which means that God has a boundary with an inside and outside. If God and world were two realities, then God plus world would be more than God. There cannot be anything like God plus something else. Hence we must abandon the notion that God and world are two realities.

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4 H.R. Schlegel, "Quantum Physics and Human Purpose", in *Zygon* (8), December 1973, pp. 200 ff.

5 "Scripture informs us that the Deity proceeded by a sort of graduated and ordered advance to the creation of man. After the foundations of the universe were laid, as the history records, man did not appear on the earth at once, but the creation of the brutes preceded him, and the plants preceded them. Thereby Scripture shows that the forces of life blended with bodily nature according to a gradation; first it infused itself into insensate nature, and in continuation of this advanced into the sentient world, and then ascended to intelligent and rational beings."
Gregory of Nyssa, *On the Soul and the Resurrection,* Nicene and Post-Nicene Fathers, Series Two, Vol. V: 441 B. Patrologia Graeca, Vol. 46:60 A.

5. Practical Implications

(1) "Nature" terminology is misleading, since it separates man from the rest of the universe, attributing transcendent value only to man and not to the universe. This terminology is better abandoned. "Creation" is the Christian word. If a secular word is needed, it is best to use "universe".

(2) Man does not exist apart from the universe, nor does the universe as known by science exist apart from man. Humanity and the universe are interlocked parts of a single system. That system cannot be made into an object without distortion. It is like humanity's body, not like an object outside humanity.

(3) Man deals with this universe not in one way, but in several. Science-technology offers one way, but it is by no means exhaustive. Three ways can be envisaged:

a) dealing with it to create the good through understanding and manipulation, but without idolizing it or being totally absorbed by it;

b) caring for it as one cares for the body, or as a priest cares for his people, and developing it; and

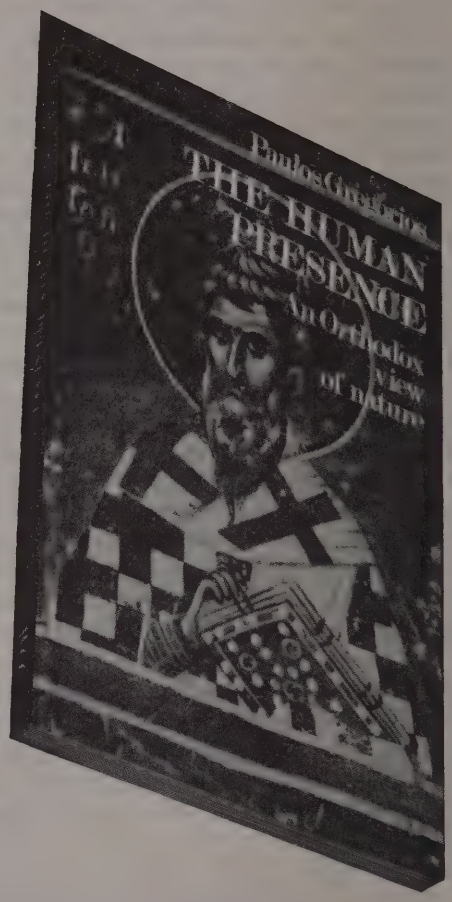
c) dealing with it through symbol and ritual to transcend it and to relate oneself to the mystery of the Creator whose energy constitutes it.

(4) These three ways are complementary and not exclusive of each other. All three are necessary. Only a combination of the three can make us fully human. Even the Antonine monks in the Egyptian desert knew it. They combined working with their hands, usually, weaving baskets, caring for the animals, and sacramental worship. Human culture must also provide for all three approaches to "nature".

THE HUMAN PRESENCE
An Orthodox view of nature

by Paulos Gregorios

This book by Paulos Gregorios, the Syrian Orthodox theologian and Metropolitan of New Delhi, is a Christian contribution, especially from the Orthodox tradition, to the current debate provoked by the ecology and resource crisis, and the search for a new understanding of the relation of man and nature provoked by that crisis. It is a response also to previous ecumenical contributions to the debate provoked notably by the ecumenical study by Prof. Thomas S. Derr on *Ecology and Human Liberation.* In chapters on "The Nature of Nature" and "Nature of Science", Metropolitan Gregorios examines the Christian teaching on nature through Christian history. There is a special section on some contemporary contributions, particularly by Process Theology. But the main part of the book deals with the Eastern cosmological tradition beginning with St. Gregory of Nyssa, and continuing through St. Basil and the Dionysian writings. The book concludes with some reflections on the Eastern Church's contribution to the search for ethical norms with which to face the practical problems posed by the future of technologically organized and dominated societies.



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Metropolitan Paulos Gregorios shares the Holy Communion at the Ethiopian midnight Christmas service. The Orthodox service was celebrated Jan. 7 according to the Western calender with participants from the Central Committee meeting in Kingston, Jamaica.

IV

Commentary of the Working Committee

(Morscharch, Switzerland, July 1977)

"THEOLOGY, SCIENCE AND HUMAN PURPOSE"

(At its annual meeting, July 1977, the Working Committee received the reports from the Cambridge and the Zürich Consultations. The following is the Committee's commentary on those reports and its summation of the issues and questions for further reflection.)

A. Relation of Faith, Science and Technology to the Search for Truth and to our Vision of the World

1. Evaluation of Science

Modern science is closely related to positivism, causality and objectivity, and consequently to secularization. If religion is interpreted as the affirmation and observation of a *visible* intervention of God in nature, both physical and social, then modern science is bound to appear a-religious, if not anti-religious. This interpretation has been the starting point of the conflict between faith and science. However, it is a misinterpretation of faith. In the past the Christian view of a desacralized and not divine nature has actually been an assistance to the development of modern science.

Contemporary science is becoming less assertive, at least in the Western world, in its claim to find the ultimate truth of reality. Scientific literature speaks less of definitive laws, more of hypothetical theories; less of determinism, more of probability; less of cumulative progress in knowledge, more of changing approximate models; less of essentialist, more of conventional language about nature. Consequently we find some renunciation by contemporary science of the claim to attain unqualified truth. Instead, scientists, without relaxing their emphasis on empirical tests of theories, often make their choice of models by criteria of simplicity or elegance. In practical terms they emphasize convenience, prediction, fecundity and efficiency. In the popular view technology seems to be the goal and the measure of science. We ask if this change from early modern to contemporary science is felt today all over the world. Is it general also among working scientists? (See Cambridge Report).

Science is becoming more specialized and consequently has difficulty in providing a unified vision of the meaning of the world and of the place of human beings in this world. The growing predominance of technological efficiency over knowledge and the contemplation of truth will influence any new quest for synthesis. We ask if the rule of objectivity and the language of conventionality are sufficient to enable science to offer to humanism a basis for its meaning.

2. Evaluation of the Situation of Faith

It is certainly true that modern science has contributed to the purification of many human expressions of Christian faith. Faith does not any longer compete with scientific objective explanation. Faith cannot be considered as a technological tool of supranatural source. Faith is related to the confession of the invisible and yet living God, and with free obedience of his word, rather than to empirical observation of God's interventions in the physical and social world. We ask if this purification has led to a retreat or to a recovery of the true nature of the faith.

In fact, the danger is that faith abandons its power to help to comprehend the destiny of the world, while the world becomes exclusively dominated by scientific knowledge and technological success. The wholeness of truth disappears in specialized information. After the competitive conflict between faith and science, we have a schizophrenic divorce between them. We ask if this evolution of theology is not an exaggerated reduction of its claim to know and to express an objective and universal truth.

Respect for the autonomy of science has brought faith to a loss of nerve at the level of knowledge, and this just at a time when contemporary science could be more open to a new encounter with the meaning of religious language, and in which technology asks for ethical guidance. We ask if the time is not ripe for a new evaluation of the respective contributions of faith, science and technology for the benefit of a humanity uncertain about the existence of truth, anxious about the usefulness of technological power, hesitating

about the status of religious conviction and of theological confession.

3. Autonomy and Interaction of Faith, Science and Technology

First, it seems to us that Christian faith must make a positive appraisal of science and technology as gifts of the God in whom our faith is founded. Faith is the source of freedom and of Service, and the God-given vocations of science and technology are areas in which this freedom and this service can be exercised. Without such a positive appraisal we always oscillate between an overestimation and an unjust devaluation of human capacity. We ask if the Christian view of creation as vocation, and of the Kingdom as universal promise can help science in its problems about truth and technology, and in its anxiety about effects and limits.

We need a mutual critique. The content of faith is surely given by revelation, but the expression of faith can be helped by science to distinguish itself from credulity, fetishism, fiction, and confusion with magic. Science can be protected against the pride of reason, technology against the temptation of social manipulation. We ask if this mutual critique can be obtained in a clarified and continuous encounter between scientists, technologists and confessing Christians.

Humankind has a narrow path between illusion and despair. It is the path of hope as a combination of struggle with promise, of freedom with obedience, of mastery with mystery. Hope is thankfulness for the gifts, warnings against the temptations, and conviction by faith of an eschatological benediction through God's judgement. Hope is not escape from reality, but commitment to the service of the whole society. We ask what kind of relation we can see between actual knowledge and final contemplation of the truth.

B. The Relation of Faith, Science and Technology to Human Purposes

1. Science and Technology as Promise and Threat

Science and technology are achievements of human creativity. Humanity develops them to achieve human purposes. Christians regard them as an expression of God's gift of creativity and responsibility which humanity exercises before God and in relation to the created world. Technology liberates humanity from physical constraints and gives opportunities for human development – economically, artistically, and in communication and travel. Yet people frequently experience science and technology as threats. We must ask why this is so and how we can meet the threat and realize the promise.

Science and technology represent knowledge and power. Even when (as is often the case) they are considered "value-free", they operate within a social structure that embodies values and organizes power. In human life power is often the power of some people, some classes, some races, some nations to dominate others. Hence science and technology, which can be liberating powers, are often oppressive powers. Even the power of humanity over nature is quickly turned into the power of some people to control others. For many societies the power of massive modern technologies has been experienced primarily as the agency of military, political and economic exploitation. (See Cambridge Report, Section 2.)

Even well-intended uses of science and technology usually have unintended consequences. These are of several kinds. (a) They sometimes affect human self-understanding. The same achievements that have enhanced human powers have sometimes led people to think of themselves as depersonalized mechanisms or as cogs in machines. (b) They affect the natural environment. Many an effort to increase human power in the natural order has ended in destructiveness to nature and, in turn, to human life. (c) They affect social structures. Massive technologies have led to the re-ordering of the organization of cities and nations. The automobile has influenced human life – including work habits, recreation, housing patterns, sexual practices, the saving and destruction of human lives – in ways far beyond the reckoning of the first builders of automobiles. Machines, which liberate people from drudgery, also make them dependent on vast networks of mechanical services and energy supplies. Factories organize people in relation to the efficiency of machines. Hence people sometimes experience technology as a fate, even a demonic force, beyond their control. Even if this experience is illusory, it is a powerful experience for some.

The transfer of technologies from one society to another is never the transfer of technologies alone. A technology brings with it something of the culture that produced it. A society adopting an alien technology adopts something of an alien culture. To introduce into any society the automobile and airplane, radio and television, even a soft-drink bottling factory is to modify traditional habits, sometimes in unexpected ways. Since culture is never static, the changes accompanying new technologies may bring genuine benefits. Developing societies often ask for new technologies. But technology also frequently becomes an agent of cultural disintegration, not only deliberately (as in A.1 above) but also unintentionally.

The success of science and technology in solving certain problems has led to illusions that they can solve all problems. Popular expectations frequently assign to technology a messianic role, characterized by the promise of the fulfilment of all human aspirations. People then may be unprepared when technology fails to solve some problems and produces others. There is a need to distinguish what science and technology can and cannot do. Increasingly the industrialized world is hearing the statement, "Some problems have no technical solutions", but require a basic reorientation of human purposes and values. The meeting of many human problems has both a technical and a non-technical aspect. For example, an essential part of the answer to human hunger is techniques of food production; but by this time there is overwhelming evidence that increased production will not solve the problem apart from attention to human greed and social-economic organization.

Questions for further consideration:

How can science and technology be made the servants of a just and sustainable society?

What is the relation of the human creativity that is expressed in technology to the creativity of God in the world? Is it humanity's responsibility under God to accept risks in technological ventures?

What are the socio-technical and socio-economic processes whereby a technology from one milieu is appropriated by another milieu? What help is there in the idea of "appropriate technology"?

2. Participation of People, Social Groups, and Nations in Making the Decisions and Exercising the Power that Affect them

The appropriation of science and technology, even for the sake of giving people power over their lives, frequently removes from people the power to make decisions that affect their lives.

One reason is that large-scale technologies may bring desired products and services to people at the cost of depen-

dence on giant organizations (governmental agencies or business corporations) that are remote from the people, hard to influence, and governed by other interests than the service of people.

Another reason is that science and technology depend upon an expert and managerial élite. Societies come to depend upon "the priest of the machine" (Spengler), who can manipulate the mysteries beyond the comprehension of ordinary mortals. People without sufficient scientific knowledge cannot make wise decisions on some issues; yet they are not convinced that the experts can either, and they do not want to deliver over to experts the decisions that may help or destroy them. Contemporary life shows two conspicuous examples.

The first is the use of nuclear energy. Here is a technology that may provide energy to compensate for the dwindling supplies of fossil fuels. Already some societies are using it and more are seeking it. The hazards connected with it – accidents, diverting of nuclear materials to weapons, sabotage, transportation and disposal of wastes – are real. Accepting risks is part of the venture of human life, but not all risks are ethically justifiable. Controversies rage about the risks. Citizens and governmental policy-makers cannot judge these issues without scientific information, but the opinions of scientists will not determine the value that society puts on large supplies of energy. People cannot assess risks without expert judgement. Unhappily, eminent experts disagree in assessing risks. The citizen is not entirely sure how far the arguments among experts reflect differing scientific opinions and how far they reflect differences in values and political judgements.

The second example is genetic experimentation, particularly with recombinant DNA ("gene splicing"). This new technique may give the means for preventing diseases that have haunted human history. Some scientists warn that it may unleash new diseases. So serious is the scientific concern that geneticists recently observed a prolonged self-enforced international moratorium on such experimentation, while they drew up guidelines for further experimentation. Now governments, national and local, are considering legislation on this issue. The normal government policy-maker or citizen cannot evaluate appropriate guidelines without scientific advice. Yet people, who may be helped or hurt by the experimentation, do not want to turn over decisions to an expert élite, who in their enthusiasm for experimentation may have different values from the public at large.

Scientists have long fought, sometimes against superstitious and tyrannical restraints, for freedom of enquiry and experimentation. But society has a right to *some* control and direction of research. This is most obvious in the case of technology. For example, many societies have decided (at least in their public stance) that research on bacterial warfare is unethical. But even pure research has ethical limitations. There are widespread restraints upon experimentation on people without their "informed consent". And now even experimentation on bacteria is restricted for the sake of public safety.

The advances of science and technology make urgent the question of decision-making that affects the public good. There is a role and responsibility for scientists and technologists. They cannot simply assert that their activity is value-free. They have a responsibility to exercise their own ethical judgements – not to impose their judgements on society, but to alert society with candour to the ethical significance of their actions. Then there is a role for the public. No matter how able the expert, the people affected by decisions have a moral right to participate in the making of the decision.

Questions for further consideration:

How can wide participation of people in decision-making be realized, and how can the churches participate in decision-making under conditions:

a. of ideological and political pluralism,
b. of centralized control,
c. where whole societies are highly dependent on external political and economic powers?

C. Nature, Humanity and God

There is need for a new theological vision and a working out of its consequences for the understanding of science and technology in the struggle for a just, participatory and sustainable society.

1. A New Theological Vision of Nature, Humanity and God

There is emerging today a theological vision, in some ways new, in other ways a recovery of biblical themes often suppressed in the recent past. It shows humanity, society and nature as creatures of a creator God, who is not identified with nature, although nature can declare his glory and show his presence. On the other hand, humanity in its freedom and creativity is given a dominion and stewardship in relation to the rest of creation. Humanity, however, abuses its dominion over other creatures and threatens the structure of creation. Humanity, society and nature need salvation through Christ. He liberates humanity from the abuse of power for the exercise of stewardship. People manifest their solidarity with other creatures and look at them as partners on the path to redemption. Can this vision be developed in ways relevant to the impact of science and technology on persons and society today? The Zürich report is an attempt at such a development.

This theological position may be distinguished from some familiar alternatives.

On the one hand, the Zurich report states: "... the realization that God is One and Supreme, and therefore transcendent, effectively desupernaturalizes the world, ridding it of superhuman personal power, whether divine or demonic, and placing man in a position to use his powers rationally in dealing with nature". This conviction found expression in the OT prophetic struggle against nature religions in which natural forces and objects are identified with gods. 17th century natural science was in some respects a negative reaction against 16th century magic and hermetic cults; this objective and experimental science was anti-magical, anti-animist, and demythologizing. The contemporary return, within technological cultures, of beliefs in occultism and astrology, although contrary to the Christian belief in the relation between humanity and nature, may be recognized as a defense that individuals adopt against what appears to them as the meaningless and inhuman character of modern society.

On the other hand, the Zürich Report states: "Nevertheless, nature is not to be evaluated simply in terms of human needs and interests; and to think that it is, is simply a mark of folly. God created the greater part of the world for its own sake – a point that comes home to us, with our knowledge of the immensity of the universe, even more strongly – and wisdom consists fundamentally in recognizing this and the limitations which it imposes upon us."

Many industrial societies combine an instrumental view of nature with a form of humanism that has been established and consolidated within European consciousness since the time of the Renaissance.

The key idea within this concept is the placing of man at the centre of history, i.e. an idea that is predominantly anthropological. In its development as a method, this idea has evolved as an extremely fruitful one as regards the basic forms of man's creative potential. Its philosophical expression was felt in the Cartesian affirmation of the authority and self-sufficiency of the human intellect and formulated in the *Cogito ergo sum.* Its scientific expression is to be seen in the proliferation of the inductive method. Again, in the social sphere, humanism is to be witnessed in the highlighting of personal initiative as the worthiest of human attributes. If it were possible to characterize in a single word the inspiration of anthropocentric humanism, then this world would probably be "individualism", i.e. the affirmation of the rights of the individual in all important spheres of human life. Here lie all the practical advantages and disadvantages of anthropocentric humanism, finding their reflection in our contemporary civilization: a humanism that has sprung from Christian cultural sources. But from its inception the idea of anthropocentric humanism involved a significant distortion of Christian truth, namely, it places at the centre of history *man* in place of God in Christ. Pushed to its extreme, therefore, anthropocentric humanism led to atheism.

In its view of the relation of man to nature, anthropocentric humanism sees man as God-like knower and manipulator; thus it made the development of science and technology possible. God meanwhile was pushed to the periphery of the natural world, as an "unnecessary hypothesis". The negative aspects of this instrumental view have led many to question its validity in the 20th century, as we have described in earlier parts of this report. It should be remembered, however, that it was a view that was explicitly advocated in the 17th century, on theological grounds of human creativity and freedom.

2. *Biblical Insights on the Concept of "Just, Participatory and Sustainable Society"*

If a new vision of nature, humanity and God is to be brought to bear on the concern for society, we need also a theological view of society, and especially a theological interpretation of the concepts of "justice", "participation", and "sustainability". All these terms are often used uncritically and without definition in the modern context, and consequently they tend to carry the meanings given them in secular political debate. These may be ambiguous, one-sided, and often much narrower than corresponding concepts in the Bible and Christian history. For example, "justice" may be defined wholly in terms of economic equality, without reference to "freedom" or the quality of inter-personal relations. What is needed is a brief biblical and theological analysis of the three key concepts, comparable to that given for "nature" in the Zürich report. We now attempt a brief analysis in this direction.

Christians are not a separate race with specific solutions for the problems of the world. But Christians are a called people, who look to the guidelines expressed in the revelation of God for the continuous new creation of the whole of humanity. That is the reason why we look to the testimony of this revelation, that is to the Bible, in order to understand justice, participation and sustainability in the light of God's action, promise and commandment. In so doing we do not manipulate the Bible to legitimate our human slogans. On the contrary we seek to enlarge, to consolidate and to correct our human proposals in the light of the self-revelation of God.

Justice in the Bible is the assurance that God does not neglect man's destiny, that God resists arrogance, takes care of humility. To have a just God is to live outside the darkness of fate. In society justice is a practice of the laws given by God to protect the weak, to limit the strong, to maintain community against disruption and to give all people the right to defend their neglected rights. Without justice man is lost in revolt or resignation. The main connotation of justice is not so much equality and self-interest as attention to the neighbour and companionship in the common inheritance of the grace of God.

In this light a "just" society may be interpreted as a society in which the cry of human hope and suffering are heard. We are responsible more to realize justice than to use it for our own advantage. Justice is never a static self-defense, but always a dynamic creation. Justice is never definitively established, but always a search in the fear and the hope of the judgement of God, which brings liberation and redemption, forgiveness and health.

If we seek a biblical basis for *participation,* we may find it in the concepts of "covenant" and "communion". According to the Bible, God reigns not by imposed domination but by confirmed covenant with his people and he draws his people into communion with each other and himself. To participate is therefore to move further in an unfinished enterprise that is the common history of God with human freedom and of humanity with the divine purpose. Participation is the expression of membership in a common body. The Bible does not give an idyllic description of covenant. We see the temptation of monopolistic power, e.g. among the biblical kings, and also of the powerlessness of fragmented individuals. But God does not resign in his quest for human participation. After the solitariness of the crucifixion of Jesus we see the reconstitution of communion with the risen Christ.

In this light a "participatory" society may be interpreted as a society in which the community is neither imposed nor forgotten, in which decisions are shared and also in which the processes of sharing are not the means to postpone decisions. Participation respects existence of personal responsibility, but personal responsibility respects opportunity for collective participation.

If we seek a biblical basis for *sustainability* we may find it in the concept of the faithfulness of God, which in spite of sin maintains humanity and the whole non-human creation for the sake of the revelation of the glory of God. Sustainability is the expression of the goodness of creation, of the effectiveness of reconciliation and of the hope of redemption in spite of the power of chaos.

In this light a "sustainable" society may be interpreted as a society in which the consciousness of the promise remains greater than the consciousness of threats. This is possible if humanity reacts to these threats more in wisdom than in fear. The faithfulness of God to creation is the foundation for the activity of man in this vocation.

3. *Theological Stances and Ethical Consequences*

Christian visions of nature, humanity and God have consequences for ethical decisions in a world of science, technology, and political and economic activities. Yet Christians are often perplexed about the precise meaning of faith and theology for practical decisions. They may be as puzzled as the rest of humanity, for example, in deciding which precise forms of political and social organizations best serve justice or (to recall two cases already mentioned) what to do about nuclear energy or research on DNA. Uncertainties and differences in judgement are to be expected within the Church.

Two temptations must be avoided: (1) To make faith irrelevant to ethical decisions. This is to deny the Lordship of God over all life. It is often a convenient evasion of the demands of discipleship. (2) To try to find in the Bible definitive answers to questions never before faced by human-

ity. This is to avoid the responsibility that God gives his people to use their intelligence and follow the guidings of the Spirit.

Christians share a faith that God has met them and showed his judgement and love in Christ, that Christ has called them to share in the kingdom of God, that God's kingdom is a kingdom of grace, justice and peace. Christians have used various methods for enacting this faith in ethical decisions. We list only a few examples of ways in which Christians and the Church have gone at the task of making contemporary ethical decisions:

a. They have seen the Bible as a source of ethical laws to be applied to changing situations.

b. They have drawn from the Bible general ethical principles, from which they have moved through "middle axioms" to specific decisions.

c. They have emphasized the uniqueness of specific situations and have sought to find the most appropriate response of love to each situation.

d. They have found analogies between biblical and contemporary situations or between symbols and ethical actions, thus drawing from Scripture parable-like illumination on decision of today.

e. They have sought with the help of the social sciences, to analyze the structures of social organizations and to learn how those organizations serve human needs or oppress people.

f. They have looked for guidance of the Holy Spirit or the inner light, working both through prophetic individuals and the community of faith.

g. They have discovered in the biblical story insights, illuminations and analogies that affect their perception of human relations and of the meaning of love in human affairs.

We may expect continuing conversation among Christians about the best ways of relating theological convictions to practical decisions. Differences of judgement remind us not to condemn quickly those who come to different conclusions on specific issues. But our unity in Christ reminds us of a responsibility to learn from one another, to seek fuller insights, and above all to avoid complacency in the face of evil.

Christians are called to strive for social justice, and in so doing often work with people of other faiths and ideologies. The problems and opportunities vary greatly in differing situations. A first step is to realize that the Christian responsibility before God in society is to seek good for all people, not advantage for Christians. This purpose opens up possibilities for cooperation.

Christians will find that many people share a concern for human dignity, community, and justice. People of diverse religious and ideological convictions want, in at least some sense, a just, sustainable and participatory society. Christians can cooperate with many persons and groups in efforts for the common good.

Christians can maintain an openness for conversation with all who will converse openly. In such conversations Christians will expect both to speak and to listen, both to testify to their convictions and to learn from others.

Christians will bring to cooperative efforts some distinctive emphases, which they will make more or less explicit depending upon the occasion:

- the love they have known in Christ, seeking embodiment in justice, compassion, and a special concern for the oppressed;
- an appreciation for nature as God's creation;
- a gratitude for science and technology as gifts and responsibilities to be exercised before God and for all creatures, and under the guidance of love;
- a conviction that creatures exist primarily for God, just as God exists for creatures;
- a warning against the temptation to use power without limits for self-affirmation and self-enrichment (Matt. 4:1-11);
- an interest in a quality of life that includes economic goods and the gifts of technology, incorporating these in a community with more than economic and technical interests.

And Christians will bring to their efforts a hope in God as the ultimate Lord of life. This hope gives a measure of freedom from shifting moods of optimism and pessimism. It is a hope in a Kingdom of God, already active in history, to be completed only eschatologically. It is hope and confidence in the saving power of God for humanity and all creation.

Questions for further consideration:

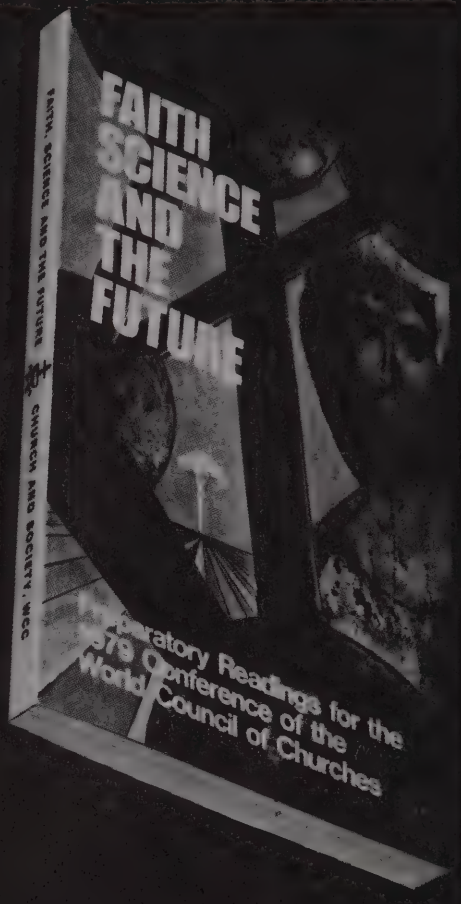
How will Christians decide when to say *yes* and when to say *no* to dominant forces, opinions and attitudes? How will they find a basis for cooperation in good will with other people and social groups, despite differences of opinion and conviction?

How do Christians relate their ultimate hope in God and his Kingdom to their hoped for relief of world hunger, for answers to the energy crisis, for liberation of peoples from injustice?

In what ways is the victory of Christ over principalities and powers a victory over the fateful aspect of technologies and social structures?

What is the meaning of the Christian belief in human responsibility for creation (stewardship) for employment of technology?

Conference planners at MIT. Left: Gorden Schultz, Paul Abrecht. Right: David Rose (MIT Professor), Barbara Weinblatt (MIT Conference organizer), Peter Scherhans (Heidelberg Theological Student and Organizer of the Conference with Science Students).


FAITH SCIENCE AND THE FUTURE
CHURCH AND SOCIETY: WCC
Preparatory Readings for the 1979 Conference of the World Council of Churches

FAITH, SCIENCE AND THE FUTURE

Preparatory Readings for the 1979 World Council of Churches' Conference on the Contribution of Faith, Science and Technology in the Struggle for a Just, Participatory and Sustainable Society, to be held at the Massachusetts Institute of Technology, Cambridge, USA, July 12-24, 1979.
The 1975 WCC Assembly said:

The responsibility that now confronts humanity is to make a deliberate transition to a sustainable global society in which science and technology will be mobilized to meet the basic physical and spiritual needs of people, to minimize human suffering and to create an environment which can sustain a decent quality of life for all peoples. This will involve a radical transformation of civilization, new technologies, new uses for technology and new global economic and political systems... The world has reached the end of a triumphalist era in the use and development of science and technology.

Its statement provides the starting point for the Conference and this book opens the debate on the issues proposed for consideration. There are chapters on:

- science and technology as human understanding and their promise and threat;
- the Christian understanding of nature, humanity and God;
- the need and prospects for an ecologically sustainable society;
- specific ethical problems like: energy for the future; the biological manipulation of human life; environmental deterioration; technology and the oceans; etc.
- how science and technology become power and how that power is used and misused in human affairs;
- technology transfer and dependence;
- plea for a post-modern society.

Whether you are a popular, participatory activist or a convinced elitist technocrat, you will be challenged. Help the more than 400 participants in the 1979 Conference by contributing your ideas to its organizers. Address comments, criticisms and suggestions to: Church and Society, World Council of Churches, 150 route de Ferney, Geneva, Switzerland.

V

STATEMENT "CHRISTIAN HOPE AND THE NATURAL SCIENCES" FROM THE COMMISSION ON FAITH AND ORDER

(Bangalore, India, August 1978)

Addressed to the Church and Society Conference at Cambridge, Mass., July 1979.*

I. Scientists and Christians

We live in a world largely dominated by science-based technology. As Christians, called to serve that world in the light of our faith, we must examine the resources of our tradition to see what positive contribution we can make to this growing technological civilization. Of course, Christians of other eras have participated in important ways in the development of science and technology, but the record of the Christians' influence is complex and the subject of much historical dispute. On the positive side it has been argued that the scientific and technological mentality appeared and flourished in Christian lands and thus apparently was favourably affected by Christianity. The Christian doctrine of creation meant that nature itself was not sacred and might be approached as object, not subject. Nature also was the handiwork of God, and studying it was an act of piety. The medieval scholastics' conviction of the rationality of God fostered the notion of order and intelligibility in the universe, prerequisites for scientific exploration.

On the other hand, Christian lands did not everywhere give rise to a scientific culture, but only in the west, and there only after a millenium. Other influences seem to have been important. Perhaps the barbarian incursions of the first millenium, which destroyed the old order, predisposed the mind to receive new ideas. Trade routes with the Middle East brought innovations with cultural repercussions. Even accident and chance may have played key roles. In any event, the Church itself was not regularly a patron of free scientific inquiry; and in the long run the rise of secularizing movements and philosophies after the 17th century produced a scientific culture at some distance from active Christian influence.

These examples are only suggestive of the complexity of the debate. The relation between Christianity and the origins of scientific and technological society are ambiguous, and we must be cautious about our claims. We cannot accept, for example, the thesis currently popular in some quarters that Christian faith is the direct cause of a disrespectful, reckless technological exploitation of nature. This view is untenable on the evidence of history.

Perhaps it would be wisest to say that Christianity was not a sufficient condition for the appearance of science and technology, but that certain Christian ideas and attitudes may have been necessary to this result. In any case we look now for ways in which Christian faith in our time may engage constructively with scientific and technological culture. And the first and most basic thing to say is that we affirm the presence of these skills as a positive good for humanity. Withdrawal from technology is a romantic notion which would deprive millions of people of any viable future. Technology, and the science which underlies it, are essential to human development and wellbeing, making it possible for God's gifts in creation to be widely shared.

Christians might contribute usefully by encouraging a realistic understanding of the work of scientists and technologists, refusing to yield to exaggerated expectations or fears. The researchers and engineers are neither devils nor saviours, neither the agents of doom nor the creators of utopia. Such polarized attitudes are dangerously unreal and in the long run, through fear or disillusion, will poison the atmosphere in which these people pursue their tasks. Their work is, rather, amenable to human control and, of course, has its human failings.

Both Christians and scientists could further improve matters be repenting of and abandoning the triumphalisms which have disfigured their past. For scientists this has taken the form of promising endless progress and the fulfilment of all human hopes. For Christians it has meant the arrogance, or complacency, of thinking that their self-contained theological systems say the only important things about human life and destiny. For both scientists and Christians, triumphalism has meant a claim to know too much, to explain reality comprehensively and definitively. Self-criticism and an openness to constructive criticism from others would help both communities, improve their relations, and allow them to serve the human race together.

II. Creation and Purpose

When we turn from basic attitudes and intentions to substantive matters, we discover at once a serious problem of understanding between scientists and Christian theologians. The latter focus on a particular event, the life, death and resurrection of Jesus Christ.[1)]

In that event they see God revealed, so that their knowledge of God has its centre and content in a particular history. Then when they turn to a matter like the origin of life and of the world, they in effect understand it in the

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* For summary of recent events, see the preparatory paper for this study by Jan Milic Lochman, "Trends in the Ecumenical Dialogue on Faith and Science", in *Giving Account of the Hope*, for the Bangalore Conference.

1) The terms "resurrection" and "acts of God" (below) are themselves part of the methodological problem between theology and science, but the present group did not discuss them.

context of what they know from their historical experience: if God has given us life in Jesus Christ, it must be his power as creator which is manifested there. Similarly, for the ancient Hebrews the event of the Exodus in which they felt themselves claimed by God was definitive. It was this experience which formed the basis of their subsequent conclusion that this God must be the one God, the Creator of all that is. And to express this idea they developed the creation narrative with which the Bible opens and which the Church inherited.

Obviously this is a process of reasoning quite unlike that of the scientists, who look first at the world of nature to see what is happening there. Their observation of the universe is the basis for their theories, their interpretations. They hope to discern there a nexus of events that is intelligible – and this hope has been increasingly fulfilled. If they do move from their observations to theological statements, they are engaged in "natural theology", rather than the theology of revelation. It may be unwise to take this step, to deduce theological affirmations from scientific observations; but the two are not necessarily unrelated.

It has been commonplace in recent years to say that there is no real conflict between scientific and traditional theological views of creation. They belong to different realms of discourse. The former discusses the behaviour of matter and energy, the latter the meaning of our existence. Creation for the theologian is not cosmology, but a confession of the dependence of our lives on God. There are other reasons, too, why the two disciplines are alleged not truly to interact. But this separation must not be pushed too far. An integrated world view would find both scientist and theologians interpreting the significance of human life and the natural world (and thus how they are to be treated) and scientists helping us all to understand the ways of God's creation (and thus possibly enriching our knowledge of God). They would become open to each other and, quite properly, vulnerable to each other's critique.

Whether or not the scientific approach can help us to understand the "mind of the maker" is a subject of dispute. But without entering again the problem of natural theology, with which many of us have difficulties, we may consider some illustrations of the interaction.

It has been a popular Christian notion that "creation" means the beginning of the universe at a moment in time; and thus piety has been attracted to the "hot big bang" theory of origins, finding it a reinforcement for theology. But time itself is an aspect of creation along with space, energy and matter, as scientists remind us; and it is meaningless to think of creation "in time", or at a moment. Creation is a far more radical and profound concept. Science thus puts useful limits to religious language and in fact affects, as it has throughout history, the way believers appropriate the Christian message.

Again, recent investigations have enabled scientists to piece together a remarkably comprehensive view of cosmic development, from primordial particles through the appearance of organic matter to the self-consciousness of *homo sapiens*. The picture is that of a continuous process in which new and more complex forms emerge from simpler levels. There is also much death and destruction in the process, but the scientist is apt to be impressed with the way new existence continually emerges from the demise of the old. Overall one gets the impression of fecundity, of endless creativity. It is, in short, "continuous creation". And theologically minded scientists have seen there a correspondence with the intention of Christian doctrine to describe God as the sustainer and preserver of the world. They do not claim to *derive* the doctrine from their science, but rather let their science enrich their understanding of doctrine.

Does this continuous cosmic process have a purpose? The scientist in his professional capacity does not ask questions which look for purpose. Some actions, for example in biology, may *look* purposeful, but they do not require explanations involving purpose. The presence of purpose in the development of the universe cannot be read off directly from science. It is, however, a permissible interpretation of the data, if anyone should choose so to interpret them. Chance, the random behaviour of particles at the micro level, does not rule out this interpretation; for patterns frequently emege at the macro level.

For the theologian, on the other hand, the idea of purpose is a central conviction which is not derived from observation of the natural world, but from the history of the acts of God. It is an anthropocentric statement, focussed on human destiny, not on the natural history of the cosmos. It would be dangerous for theology to find its own concept of divine purpose in scientific discoveries, for the direction of nature could be the result of an innate *telos* in things – in the classic illustration, as the oak tree is the *telos* of the acorn, and contained within it. Such an idea is of no help to human beings who would act "purposefully". Purpose as giving meaning to our lives belongs to the theological concept, where we can anticipate our future, and anticipate giving an account of our lives before the God of history.

Yet despite the difference in the nature and intent of these concepts of purpose, the Christian who looks at the cosmic development, observing particularly the emergence of the self-conscious person who is capable of responding to God, may find some confirmation and enrichment of what he knows on Christian grounds. Of course, this contingent universe will one day die, and time with it. But a Christian who reads its history may yet find encouragement in its direction, in its linearity, in its evolution of ever-higher forms, to trust the significance of his life to the providence of God.

III. Nature and Hope

Science and theology have also evaluated nature from different perspectives. For natural science nature is non-moral. It is simply given, a brute fact. But there is a theological tradition that nature is somehow "fallen" and awaiting its redemption. It cannot be fallen as man is, for it can hardly sin. Its fallenness seems rather to be in its ambivalence in relation to humanity – life-giving, but also life-destroying. Tidal waves and microbes are not evil in themselves, but they are certainly threatening to human beings. This "natural evil", as it is usually called, is different from "moral evil", which humans do and for which they are responsible.

It is useful for Christians to be reminded that for the sciences nature is intrinsically non-moral. That will focus our attention on human concerns and save us from anthropomorphizing the natural world. This is not to say that God may not have purposes for nature quite apart from humanity, as the book of Job says so eloquently. But we cannot know these purposes, and our responsibility towards nature concerns its relation to people, present and future.

The problem of "natural evil", however, remains. It is not easily disposed of by calling it a human interpretation of non-moral events. We confront the problem in its most acute form in death, in the perishableness of nature which we share. In nature death brings forth new life; but for human beings death is an *affront* to life. We do not accept it passively, nor should we; for we have a degree of self-consciousness which enables us to contemplate our death, ritualize it, and aspire to transcend it. It really does affront our nature as human. Perhaps it is not surprising that traditional Christian faith has found a link between sin and death, knowing that evil is always more than moral evil. Nor is it

surprising that the concept of " new creation" has included the conquest of death, though obviously in a way which we cannot now understand, a transformed existence to which the sciences do not speak, but to which faith testifies. It is in that theological sense that nature with all its ambivalence is included in the Christian proclamation of resurrection.

And so we come to the question of hope, the subject of the conference from which this report is written. The basis of hope for the creation is laid, theologically speaking, in the resurrection, in the new creation which God has inaugurated in Jesus Christ. Hope is based on what God has already in one sense in being, accomplished in the work of Christ. It continually breaks into and transforms our existence. But it is also not yet, awaiting a final fulfilment. Our hope in it depends on both actuality and anticipation.
Our hope in it depends on both actuality and anticipation.

The new age will, nevertheless, be a radical break with the present. It cannot be thought of as a temporal paradise. Here again science may offer to theology a contribution which is informative and confirming, though not, of course, determinative. The scientific certainty of the eventual disappearance of Earth, to say nothing of the heat-death of the universe, must put firm limits to our speculation about God's kingdom as an extension of this world. We know only – and it is enough – that we will experience his presence in ways which will exceed our present imaginings.

IV. The Human and the Natural

The discussion of death has already pointed to the distinction of man from the rest of nature. *Homo sapiens* has an extra dimension which Christians have popularly called "spirit", not so much a separate element in his constitution as a heightening or enhancement of his total being in relation to God. He is "person" in the full sense of that very biblical concept, the one who is called by God and is capable of responding. And insofar as he is tranformed by the act of God in Christ, he is a new being, that new *anthropos* of the new age.

The contribution of science to this theological picture of the human, the backing of confirmation it brings to Christian anthropology, has become quite intriguing in recent years. New understanding of the workings of the evolutionary process have shown how more complex forms – theology would say "higher" forms – have emerged from simpler ("lower") ones, with quite new properties. Thus organic matter has evolved from inorganic, and the self-conscious creature *homo sapiens* from the simplest organism. Man is an "emergent being", something distinctively different from the rest of the creation.

Human beings have, moreover, achieved a relation to the process which is different from that of any other stage. Through deliberate action on their environment, they are able to alter their own evolution. It is not so much that they change their physical constitution, although public interest in such as-yet-unaccomplished feats as genetic alteration or cloning may reveal popular aspiration for a new humanity. It is, rather, that in evolution self-conscious creatures appear who are purposeful, and so turn evolution into history. They understand and henceforth direct the process which has produced them, responding to purposes which they design – or discern. It is to this human history that Christian faith is addressed.

Of course all this is not the *Christian* meaning of human uniqueness, but there is an interesting parallelism which adds breadth to our understanding. The freedom of decision and the power over nature which man has acquired have even led some theologians to speak of him as "co-creator" with God. This phrase may at first sound arrogant, an example of the sin of pride; but we may receive it positively if we understand it to refer to special human responsibility before God and with God for the rest of the world. We are called to be God's stewards, responsible for the creation with which he has entrusted us, and for the use of the special powers with which he has endowed us. We could say, theologically speaking, that scientific and technological man was intended in the providence of God, meant to become and exploring, discovering – and creating – being.

Another aspect to the discussion of human uniqueness concerns the danger of reducing this emergent being to simpler, lower levels. Here we may find theology offering a contribution, or admonition, to certain kinds of science, or to the way some scientists interpret their work. There is a multi-dimensionality to man which must not be lost. Entirely materialistic and deterministic descriptions of the evolutionary process would be a mistake and a danger. The human personality cannot be so reduced. Its openendedness must be defended against any. who present themselves in their own work as the authors of a comprehensive view which explains all human behaviour. Scientists themselves who are investigating one level of complexity, e.g. biology, frequently resist on logical grounds the reductionist claims of the disciplines relevant to levels lower than their own, e.g. physics and chemistry.

V. Hope and the Future of the Technological Society

Any Christian account of man must consider another theme, which deals not so much with scientific theory as with the uses of science and technology. This is the realistic assessment that, until the ultimate fulfilment in the new age, human beings are sinners. Creation may be the outpouring of God's love, and new creation the final triumph of that love; but we have to reckon with an interim, this age, in which love is marred and obscured by sin. One must expect, therefore, that people will continue to use science and technology primarily to serve their own personal and social interests. And yet we know, as surely as we know anything in Christian ethics, that such enormous power must be disciplined to the service of all humanity, not to private greed or to exploitation or to war or to the power of particular states.

Is there any hope for such a redirection? Because the new age, in which God transforms our lives and frees us from sin, is already active, we are enabled at least to act towards this goal. The new being in love is not just a future possibility but a present actuality. It speaks of human unity, of mutual responsibility, where all justly share in the benefits of science and technology and in the decisions governing their use.

This is the Christian intention we bring to the public debate about the direction of the technological society. It is true that science and technology have been great boons to humanity, and have the potential for still greater and more widespread good. But potential is not actuality, and in point of fact we find this great power embedded in economic and political systems[2] which often use it for harmful ends, like the arms race. Potentially, it is free; actually, it is bound[3] Decisions about its direction are not made mainly by researchers themselves but by political and commercial agencies who control the flow and use of support funds. Natu-

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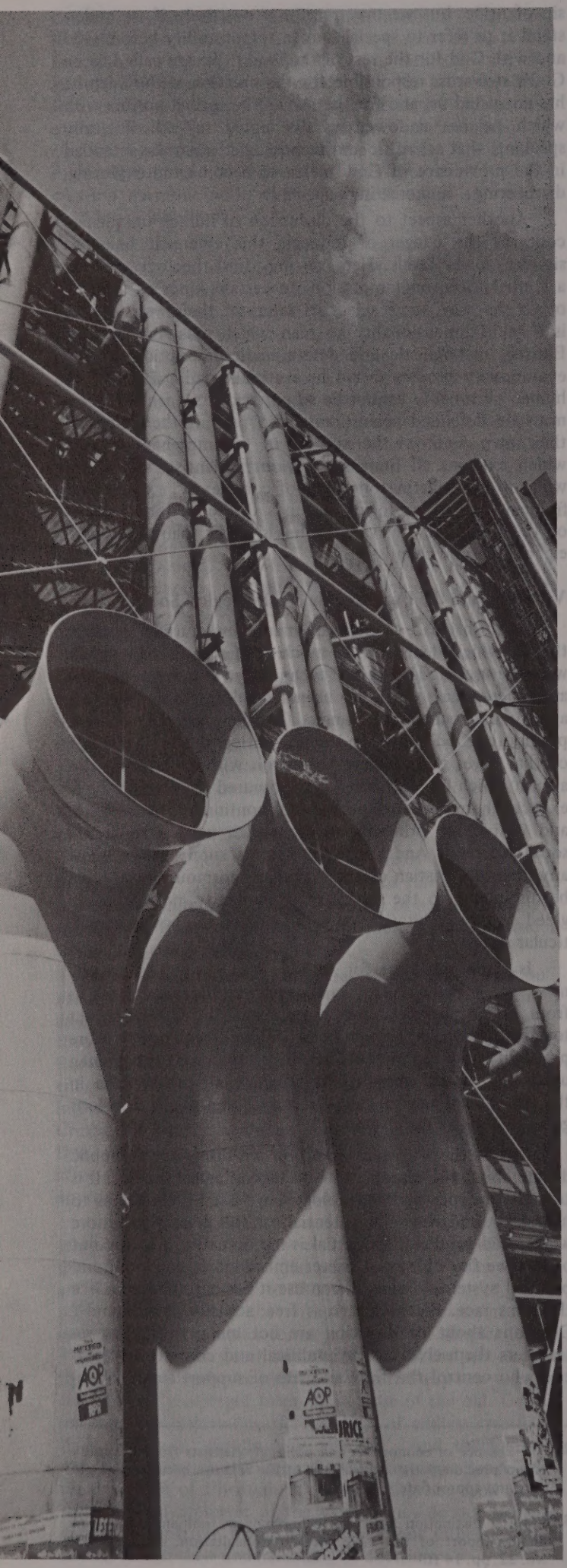
2) The absence of economists and political scientists from the study group precluded the exploration of the relation between technology and appropriate systems.

3) See the distinction between technology as tool and as system in the report of the 1975 Mexico Consultation, *Anticipation*, No. 22, pp. 14 ff.



rally enough the people who do the work are often not very happy at such outside control, arguing that decisions taken there are frequently ill-informed, based on irrational fears or hopes. Nevertheless, to avoid the elitism where those who know decide for those who do not, some sort of public accountability seems desirable. It is not, then, a question of freeing science and technology from the service of ends, but of making sure that those ends are compatible with the common good. In some countries movements for formal public assessment of the effects of proposed technological developments are already well advanced.[4] Christians can and should support these movements so that their humanistic concern for the general welfare will be influential.

It should be acknowledged that not everyone believes that science and technology can be made to serve humane goals. Some critics discern there an evil which is inherent, inevitable. It has been argued, for example, that technology *necessarily* bends natural biological rhythms to the discipline of the mechanical clock, to our detriment; or that technological society *must* expand its use of natural resources until it finally produces a collapse; or that technology alters social structures in such ways, like urban overcrowding, that poverty *increases* rather than diminishes (as in fact has happened in some places). It has been suggested that the power of technology strains beyond endurance the human capacity for responsibility and thus will inevitably be misused. To all these critics the technological society appears not as promise but as fate. Others add to this list of woes that some experiments are also inherently, essentially, evil and should not be done (although, to be fair, it should be noted that societies are now monitoring this kind of experiment).

Against such a negative, fatalistic appraisal, this report has defended the positive evaluation of science-based technology, stressing its enlarging, humanistic possibilities. Of course, one cannot be sanguine. Nothing is guaranteed. But, to return to the pursuing theme of these pages, the Christian hope in the coming new being is also a present actuality, a transformation which allows us in some measure to transcend our selfish selves and employ God's gift in science and technology for all his children.

So there is hope for the future use of science and technology on behalf of humanity, and it is related to Christian hope. It is true that Christian hope, ultimate hope, does not need to be reinforced by the proximate hopes generated by science and technology. Ultimate hope stands despite everything, and that is its power. But scientific and technological possibilites can complement the encouragement we receive from our Christian faith, and show us some ways in which our ultimate hope can be active in this world. And among those ways is clearly the just sharing, even the sacrificial sharing, of technological benefits with all the human family. Those who are called into the body of Christ are empowered to lead the way.

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4) For example, the British Council of Churches' representation at the Windscale enquiry.

REBIRTH OF IMAGINATIVE VISION

The Message from the General Secretary of the World Council of Churches to the International Congress on Religion, the Arts, Architecture and the Environment.

On behalf of the World Council of Churches I send you warmest greetings as you meet in your fourth international congress on religion, the arts, architecture and environment. I fervently hope that your congress will contribute creatively to our common struggle for a quality of life which is motivated by imaginative vision and maintained by a just, participatory and sustainable society.

You meet at a time when people every where are awaking to demand that science and technology should be appropriate to their environment and should enable them to have life in all its fulness shared by all. It is also significant that this new awakening is marked by an explosion in the arts in all their varied forms. People realise that the environment is given for the enjoyment of all, and that life consists in being and sharing rather than in having and grabbing.

Religion is concerned about the totality of our existence, and religious experience has always been expressed in art and symbol. The Christian Church has had a long tradition of creating out of the environment artistic offereing to God and to people. This tradition has been marred during the past century by an obsession with do-gooding moralism and a consequent loss of the beauty of holiness, that total commitment of body, mind and spirit to fulfil God's creation which he called good. The World Council of Churches is committed to the cause of a just society, where all participate in its total life, and replenish rather than despoil the earth. We are, therefore, committed to the rebirth of the imaginative vision without which the people perish. The new heaven and the new earth of our apocalyptic vision is the city which is open to all and is adorned with all the precious things which the environment can provide and to which is brought all the created riches of humankind. It is this vision which beckons us to be fellow-workers with God to make all things new and beautiful.

Philip Potter